Vol. 884 Number 4

OFFICIAL GAZETTE

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UNITED STATES PATENT OFFICE

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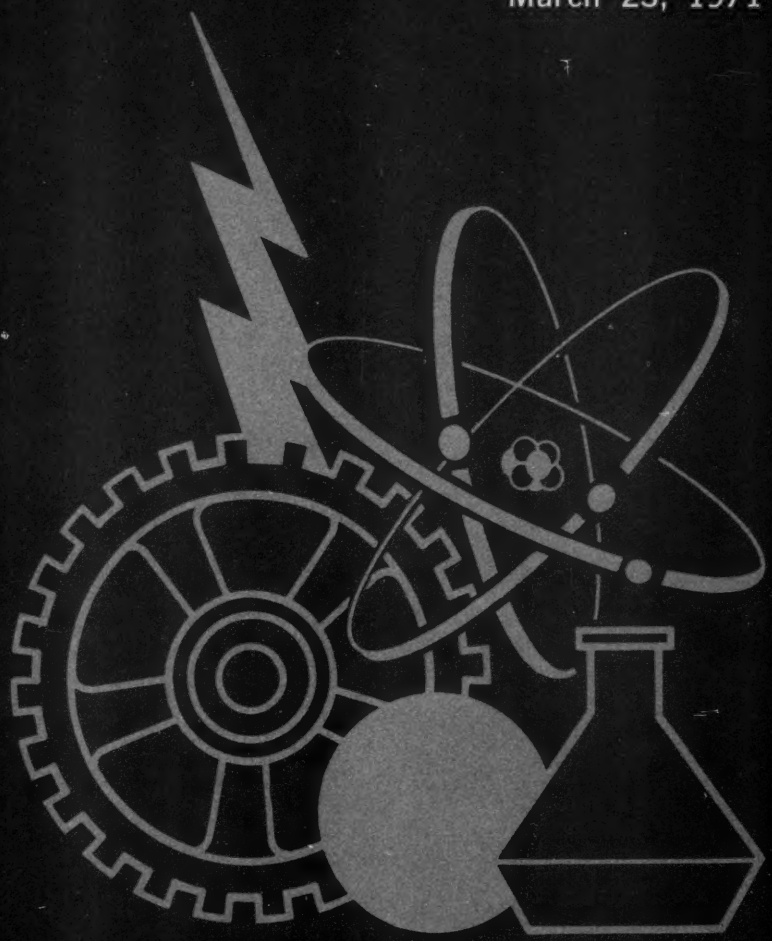
PATENTS

March 23, 1971



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OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

March 23, 1971 Volume 884 Number 4

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENTS SECTION), issued weekly, subscription $89.00 per annum, foreign mailing $22.25 additional; single copies $2.00 each.

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PRINTED COPIES OF PATENTS are furnished by the Patent Office at 50 cents each; PLANT PATENTS in color, $1.00 each; copies of TRADEMARKS and DESIGN PATENTS at 20 cents each. Address orders to the Commissioner of Patents, Washington, D.C., 20231.

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PATENT OFFICE NOTICES

Early Notification of Serial Number

To ensure prompt notification of the receipt of newly filed application papers, self-addressed post cards will be date stamped and promptly returned to the sender by the Correspondence and Mail Division.

If early notification of the *serial number* is also desired, an additional self-addressed post card should be submitted. Upon receipt of application papers with two return post cards, Correspondence and Mail Division will stamp both cards with the receipt date and return one card to the sender. The second card will be forwarded to the Application Branch where both the card and application papers will be stamped with a serial number and the card returned to the sender.

The identifying data on the post card intended for evidence that the Patent Office has received a complete set of application papers should include applicant's name(s); title of the invention; number of pages of specification, claims, and sheets of drawing; whether oath or declaration used; and amount and manner of paying the fee.

When more than one set of application papers is filed under one cover, a return post card should be attached to each set of papers for which a receipt is desired.

RICHARD A. WAHL,
Mar. 10, 1971. *Assistant Commissioner.*

Republication of Marks Published for Opposition in the Official Gazettes (Trademark Section) of February 2, 9, 16, and 23 and March 2, 9, and 16, 1971

Since it appears that a substantial portion of the interested public did not receive copies of the OFFICIAL GAZETTE (Trademark Section) for the issues of February 2, 9, 16, and 23 and March 2, 9, and 16, 1971, in sufficient time to consider the filing of oppositions, all marks published for opposition in those issues are hereby declared to be republished as of March 23, 1971, pursuant to Section 12(a) of the Trademark Act of 1946, as amended. Opposition to those marks may be filed within the time after March 23, 1971, specified in Section 13 of the Statute or by Rules 2.101 and 2.102 of the Trademark Rules of Practice. Any oppositions to these marks received prior to this republication will be considered to have been timely filed.

WILLIAM E. SCHUYLER, JR.,
Feb. 25, 1971. *Commissioner of Patents.*

Patent Suits

(D.C. Md.) West Patent No. 2,667,243 (189—46), for GLASS DOOR, *Held* invalid and not infringed. *National Steel Corp.* v. *Baltimore & Ohio Railroad,* 313 F. Supp. 934, 166 USPQ 9.

(D.C. Mass.) Smith Patent No. 2,714,978 (223—69), for DEVICE FOR DRYING SWEATERS, *Held* invalid. *Smith* v. *J. H. Smith Co. Inc.,* 315 F. Supp. 1059, 166 USPQ 266.

(C.A. Fla.) Van Waes Patent No. 2,727,069 (260—555), for PREPARATION OF UREA, *Held* valid and infringed. *Stamicarbon, N.V.* v. *Escambia Chemical Corp.,* 430 F.2d 920, 166 USPQ 362.

(C.A. Ala.) Heisler Patent No. 2,738,992 (285—59), for PIPE COUPLING, *Held* claims 1 and 2 invalid. *Johns-Manville Corp.* v. *Cement Asbestos Products Co.,* 428 F.2d 1381, 166 USPQ 359.

(C.A.N.Y.) Eichmeier Patent No. 2,739,068 (106—38.5), for STEREOTYPE MAT, *Held* invalid. *Burgess Cellulose Co.* v. *Wood Flong Corp.,* 431 F.2d 505, 166 USPQ 417.

(D.C. Mo.) Gallo Patent No. 2,746,262 (62—7), for ICE MAKING MACHINE, *Held* invalid. *Gallo* v. *Norris Dispensers Inc.,* 315 F. Supp. 38, 166 USPQ 509.

(C.A. Mich.) Troy et al. Patent No. 2,753,694 (62—106), for ICE DISINTEGRATING ICE CHIP PRODUCING MACHINE, *Held* valid and claim 4 infringed. *Unifio Mfg. Co.* v. *King-Seeley Thermos Co.,* 428 F.2d 335, 166 USPQ 70.

(C.A. Ill.) Sutter Patent No. 2,856,653 (22—10), for METHOD AND APPARATUS FOR MAKING HOLLOW SHELL FOUNDRY SAND ARTICLES, *Held* claims 1 and 7 invalid. *Sutter Products Co.* v. *Pettibone Mulliken Corp.,* 428 F.2d 639, 166 USPQ 100.

(C.A. Ill.) Sutter Patent No. 2,867,017 (22—10), for METHOD OF AND APPARATUS FOR MAKING RESIN BONDED SAND SHELL MOLDS AND CORES, *Held* claims 2 and 3 invalid. *Sutter Products Co.* v. *Pettibone Mulliken Corp.,* 428 F.2d 639, 166 USPQ 100.

(C.A. Tex.) Clark Patent No. 2,913,386 (204—195), for ELECTROCHEMICAL DEVICE FOR CHEMICAL ANALYSIS, *Held* invalid. *Beckman Instruments Inc.* v. *Chemitronics, Inc.,* 428 F.2d 555, 165 USPQ 355.

(D.C. Minn.) Johnson et al. Patent No. 2,947,104 (43—3), for WATER FOWL DECOY, *Held* claim 2 invalid. *Woodstream Corp.* v. *Herter's, Inc.,* 312 F. Supp. 369, 165 USPQ 609.

(C.A. Pa.) Allen Patent No. 2,948,899 (2—94), for WRINKLE FREE GUN BUTT PAD FOR SHOOTING GARMENT, *Held invalid. Allen* v. *Ideal Products, Inc.,* 426 F.2d 185, 165 USPQ 417.

(D.C.N.Y.) Scharf Patent No. 2,974,055 (117—4), for LUSTROUS FABRICS AND METHODS OF PRODUCING SAME, *Held* claims 1, 3, 4, 9, and 11 valid and infringed. *Metal Film Co.* v. *Metlow Corp.,* 316 F. Supp. 96, 167 USPQ 267.

(D.C. Tenn.) Holt Patent No. 2,995,999 (100—232), for BALING PRESS, *Held* invalid. *Galland-Henning Mfg. Co.* v. *Dempter Bros., Inc.,* 315 F. Supp. 68, 165 USPQ 688.

(C.A. Tex.) Levey et al. Patent No. 3,000,576 (239—499), for SPRAY GUN, *Held* valid and infringed. *Spee-Flo Mfg. Co.* v. *Braniff Airways, Inc.,* 430 F.2d 74, 166 USPQ 371.

(C.A. Calif.) Bagerman Patent No. 3,002,388 (73—483), for WHEEL BALANCING, *Held* invalid. *Bada Co.* v. *Montgomery Ward & Co.,* 426 F.2d 8, 165 USPQ 483.

(D.C. Minn.) Conibear Patent No. 3,010,245 (43—90), for TRAPS, *Held* invalid. *Woodstream Corp.* v. *Herter's Inc.,* 312 F. Supp. 369, 165 USPQ 609.

(C.A. Tex.) Levey Patent No. 3,018,968 (239—124), for CLOSED SYSTEM RECIRCULATING ASSEMBLY, *Held* valid and infringed. *Spee-Flo Mfg. Corp.* v. *Braniff Airways, Inc.,* 430 F.2d 74, 166 USPQ 371.

(C.A. Md.) Brooks et al. Patent No. 3,024,258 (260—400), for CONTINUOUS SULFONATION PROCESS, *Held* invalid. *Chemithon Corp.* v. *Procter & Gamble Co.,* 427 F.2d 893, 165 USPQ 678.

(C.A. Mich.) Walch Patent No. 3,024,301 (174—72), for WIRING GRILLE, *Held* claim 5 valid and infringed. *Panduit Corp.* v. *Stahlin Bros. Fibre Works, Inc.,* 430 F.2d 221, 166 USPQ 524.

(C.A.N.H.) Greig Patent No. 3,052,540 (96—1), for DYE SENSITIZATION OF ELECTROPHOTOGRAPHIC MATERIALS, *Held* invalid. *Nashua Corp.* v. *RCA Corp.,* 431 F.2d 220,165 USPQ 89.

(C.A. Calif.) Bagerman et al. Patent No. 3,055,221 (73—484), for PIVOT MOUNTING FOR STATIC WHEEL BALANCER, *Held* invalid. *Bada Co.* v. *Montgomery Ward & Co.,* 426 F.2d 8, 165 USPQ 483.

(C.A. Md.) Brooks et al. Patent No. 3,058,920 (252—353), for PROCESS FOR PREPARING A MIXTURE OF AN ALKYL BENZENE SULFONATE AND AN ALCOHOL SULFATE, *Held* invalid. *Chemithon Corp.* v. *Procter & Gamble Co.,* 427 F.2d 893, 165 USPQ 678.

(D.C. Wis.) Norvell Patent No. 3,069,092 (239—133), for LIQUID VAPORIZER, *Held* claims 1 and 2 invalid. *Norvell* v. *McGraw-Edison Co.,* 316 F. Supp. 198, 167 USPQ 47.

(D.C.R.I.) Torti Patent No. 3,089,310 (61—41), for TRENCH SHORING MACHINE, *Held* valid but not infringed. *Shields-Jetco, Inc.* v. *Torti,* 314 F. Supp. 1292, 166 USPQ 397.

(C.A. Ind.) McElvenny et al. Patent No. 3,115,138 (128—278), for EVACUATOR, *Held* valid and infringed. *Mercantile Nat. Bank of Chicago* v. *Quest, Inc.*, 431 F.2d 261, 166 USPQ 513.

(C.A. Fla.) Guggermos Patent No. 3,141,620 (240—3), for LIGHTING DEVICE, *Held* valid and not infringed. *Sterner Lighting Inc.* v. *Allied Elec. Supply, Inc.*, 431 F.2d 539, 166 USPQ 455.

(D.C. Ill.) Eichert et al. Patent No. 3,155,766 (174—52), for ELECTRICAL COMPONENT ASSEMBLAGE AND CASING THEREFOR, *Held* claims 1–4 and 6–9 invalid. *Technitrol Inc.* v. *Aladdin Industries Inc.*, 316 F. Supp. 639, 166 USPQ 4.

(C.A. Pa.) Cochran Patent No. 3,160,321 (222—64), for CONTROL SYSTEM, *Held* valid and infringed. *Eagle Iron Works* v. *McLanahan Corp.*, 429 F.2d 1375, 166 USPQ 225.

(C.A. Ill.) Parsell Patent No. 3,171,700 (312—200), for BAR CABINET, *Held* invalid. *Ever-Wear, Inc.* v. *Wieboldt Stores, Inc.*, 427 F.2d 373, 166 USPQ 109.

(C.A. Tex.) Van der Lely Patent No. 3,260,025 (52—228), for PRECOMPRESSED VERTICALLY STACKED, PREFABRICATED BUILDING ELEMENTS, *Held* claim 1 not infringed. *Fraser* v. *City of San Antonio, Texas*, 430 F.2d 1218, 167 USPQ 1.

(C.A. Okla.) Scaramucci Patent No. 3,266,384 (92—192), for WELL SWAB ASSEMBLY, *Held* invalid and not infringed. *Scaramucci* v. *Dresser Industries, Inc.*, 427 F.2d 1309, 165 USPQ 759.

(C.A. Okla.) Scaramucci Patent No. 3,266,386 (92—242), for SWAB CUP, *Held* invalid and not infringed. *Scaramucci* v. *Dresser Industries, Inc.*, 427 F.2d 1309, 165 USPQ 759.

(D.C. Calif.) Worson et al. Patent No. 3,274,906 (94—39), for JOINT INSTALLATION APPARATUS, *Held* claims 1, 2, 3, and 5 valid and infringed. *Edoco-Technical Products, Inc.* v. *Peter Kiewit Sons Co.*, 313 F. Supp. 1081, 165 USPQ 207.

(D.C. Pa.) Kinnan Patent No. 3,307,363 (61—72.6), for CABLE LAYING MACHINE, *Held* claims 1, 2, 5, and 6 invalid. *Henkels & McCoy, Inc.* v. *Elkin*, 316 F. Supp. 303, 167 USPQ 97.

(C.A. Ill.) Beer Patent No. 3,310,824 (15—21), for VEHICLE WASHER, *Held* infringed. *Sherman Car Wash Equipment Co.* v. *Grand Car Wash, Inc.*, 429 F.2d 1363, 166 USPQ 377.

(D.C. Oreg.) Silvey Patent No. 3,349,645 (76—40), for SAW CHAIN GRINDING MACHINE, *Held* invalid. *Silvey* v. *Nielsen Corp.*, 315 F. Supp. 211, 164 USPQ 657.

(D.C. Tex.) Huffman Patent No. 3,382,280 (260—526), for 3',4'-DICHLOROPROPIONANILIDE, *Held* valid and infringed. *Monsanto Co.* v. *Dawson Chemical Co.*, 312 F. Supp. 452, 165 USPQ 560.

(D.C. Pa.) Huffman Patent No. 3,382,280 (260—562), for 3',4'-DICHLOROPROPIONANILIDE, *Held* invalid. *Monsanto Co.* v. *Rohm & Haas Co.*, 312 F. Supp. 778, 165 USPQ 683.

(D.C. Tex.) Sanderson et al. Patent No. 3,397,522 (56—30), for COTTON HARVESTER, *Held* claims 15, 16, 18, and 19 invalid. *Deere & Co.* v. *Hesston Corp.*, 316 F. Supp. 866, 167 USPQ 102.

(D.C. Del.) Henricks Reissue Patent No. 24,017 (148—6.15), for METHOD OF COATING AND DRAWING METAL AND COMPOSITION THEREFOR, *Held* not infringed. *Devex Corp.* v. *General Motors Corp.*, 316 F. Supp. 1376, 167 USPQ 141.

(D.C.N.Y.) Myerberg Reissue Patent No. 25,402 (240—4.1), for MAKE-UP MIRROR, *Held* invalid. *Brown* v. *Myerberg et al.*, 314 F. Supp. 939, 164 USPQ 505.

(C.A. Mass.) Anderson et al. Reissue Patent No. 26,672 (76—112), for METHOD OF MAKING BAND SAW BLADE, *Held* claims 1 and 2 valid and infringed. *Contour Saws, Inc.* v. *L. S. Starrett Co.*, 428 F.2d 314, 164 USPQ 208.

(D.C. Pa.) Daum Design Patent No. 199,143 (48—31), for LIGHTING FIXTURE, *Held* valid and infringed. *Hadco Products, Inc.* v. *Lighting Corp. of America*, 312 F. Supp. 1173, 165 USPQ 496.

Certificates of Correction for the Week of Mar. 23, 1971

3,422,928	3,523,788	3,541,681	3,549,343
3,440,530	3,523,992	3,541,844	3,549,344
3,449,246	3,524,991	3,543,158	3,549,532
3,458,777	3,525,791	3,543,351	3,549,594
3,471,434	3,526,401	3,543,395	3,549,724
3,475,754	3,526,432	3,544,097	3,549,840
3,477,973	3,526,589	3,544,758	3,549,984
3,481,975	3,526,672	3,544,780	3,550,056
3,486,005	3,527,225	3,544,835	3,550,197
3,488,287	3,527,309	3,545,094	3,550,677
3,493,394	3,527,453	3,545,149	3,551,060
3,496,387	3,527,507	3,545,183	3,551,107
3,496,803	3,529,663	3,545,645	3,551,239
3,497,746	3,531,267	3,545,818	3,551,241
3,500,648	3,531,691	3,545,884	3,551,270
3,502,957	3,532,495	3,546,048	3,551,295
3,503,631	3,532,573	3,546,187	3,551,371
3,510,433	3,532,587	3,546,311	3,551,383
3,512,577	3,535,239	3,546,729	3,551,397
3,512,922	3,535,907	3,546,862	3,551,463
3,513,181	3,536,099	3,546,959	3,551,498
3,513,444	3,536,422	3,546,965	3,552,167
3,515,669	3,536,814	3,547,007	3,552,174
3,517,302	3,538,237	3,547,180	3,552,322
3,517,917	3,538,251	3,547,462	3,553,041
3,518,286	3,538,562	3,547,594	3,553,234
3,518,918	3,539,165	3,547,637	3,553,277
3,519,286	3,539,473	3,547,682	3,553,543
3,519,379	3,539,541	3,547,772	3,553,691
3,520,468	3,539,896	3,548,218	3,553,727
3,521,256	3,540,279	3,548,278	3,553,913
3,522,081	3,540,899	3,549,094	3,554,014
3,522,187	3,540,924	3,549,217	3,554,789

Disclaimer

3,542,684.—*George H. Hunt*, West Newton, Mass. VOLTAGE STABILIZED POLYOLEFIN DIELECTRIC COMPOSITIONS USING LIQUID-AROMATIC COMPOUNDS AND VOLTAGE STABILIZING ADDITIVES. Patent dated Nov. 24, 1970. Disclaimer filed Oct. 23, 1970, by the assignee, *Simplex Wire and Cable Company*.

Hereby disclaims the terminal portion of the term of said patent subsequent to May 19, 1986.

Notice of Trademark Publications in February and March

Beginning Feb. 2, 1971, the OFFICIAL GAZETTE of the United States Patent Office, consisting of patent and trademark Sections, was separated into two distinct publications, the "OFFICIAL GAZETTE (Patent Section)" and the "OFFICIAL GAZETTE (Trademark Section)." Those subscribing to the OFFICIAL GAZETTE prior to the separation have received only the OFFICIAL GAZETTE (Patent Section) beginning with the date of its separation unless they requested a subscription to the OFFICIAL GAZETTE (Trademark Section). An effort was made to notify these subscribers that they would not receive the OFFICIAL GAZETTE (Trademark Section) after the separation on February 2 unless they subscribed separately to this publication. However, the notice has been misinterpreted by some former subscribers who, accordingly, have not requested a separate subscription to the OFFICIAL GAZETTE (Trademark Section) and, therefore, have not received this publication.

In view of the above, jurisdiction will be restored for all marks published for opposition on Feb. 2, 9, 16, and 23, Mar. 2, 9, and 16, 1971, to the Examiner of Trademarks and these marks will, by notice in the OFFICIAL GAZETTE (Trademark Section) of Mar. 23, 1971, be republished for opposition by reference to the OFFICIAL GAZETTE (Trademark Section) for those dates. The republication of these marks by reference will be effective as a publication in accordance with Section 12(a) of the Trademark Act of 1946 for the purpose of opposition by any person who believes he will be damaged by the registration of the mark. Oppositions to such republished marks may be filed within the time specified by Section 13 of the Statute or by Rules 2.101 and 2.102 of the Trademark Rules of Practice. Any opposition received after the original publication and on or before Apr. 22, 1971, will be deemed to have been timely filed.

In addition, all persons desiring to receive the OFFICIAL GAZETTE (Trademark Section) should contact the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402. Subscription to this publication costs $17.00 per annum. The Superintendent of Documents has advised that all persons subscribing during March will receive the previous February and March issues of the OFFICIAL GAZETTE (Trademark Section) until the excess weekly inventory of approximately 3000 copies is exhausted.

WILLIAM E. SCHUYLER, JR.,
Commissioner of Patents.

Feb. 25, 1971.

PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner
F. H. BRONAUGH, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF MARCH 9, 1971

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	9-29-69
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	4-30-69
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	11-12-69
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	12-02-69
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—W. B. KNIGHT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	7-22-69
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Miscellaneous.	5-26-70
SECURITY, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	7-09-69
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	12-04-69
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	1-27-70
PHYSICS, GROUP 280—R. L. EVANS, Director. Photography; Sound and Lighting; Indicators and Optics; Measuring and Testing; Geometrical Instruments.	11-17-69
DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts; Household, Personal and Fine Arts.	5-18-70
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Railways and Railway Equipment; Brakes; Rigid Flexible and Special Receptacles and Packages.	12-15-69
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders Woodworking; Tools; Cutlery; Jacks.	10-27-69
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	11-03-69
HEAT, POWER AND FLUID ENGINEERING, GROUP 340—C. F. GAREAU, Director. Power Plants; Combustion Engines; Fluid Motors; Pumps; Turbines; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Vaporizing; Temperature and Humidity Regulation; Machine Elements; Power Transmission; Fluid Handling; Lubrication; Joint Packing.	3-19-70
CONSTRUCTIONS, SUPPORTS, TEXTILES, CLEANING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Receptacles; Supports; Cabinet Structures; Centrifugal Separations; Cleaning; Coating; Pressing; Agitating; Foods; Textiles; Apparel and Shoes; Sewing Machines; Winding and Reeling.	1-06-70

Expiration of patents: The patents within the range of numbers indicated below expire during March 1971, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,670,468 to 2,673,977, inclusive
Plant Patents..... Numbers 1,260 to 1,266, inclusive

REISSUES

MARCH 23, 1971

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

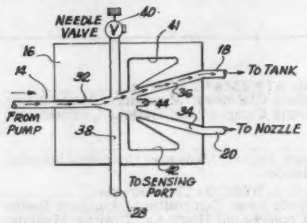
27,087
FUEL INDUCTION DEVICE

Alan M. Binder, 13 Emerson Gardens, Lexington, Mass. 02173

Original No. 3,389,894, dated June 25, 1968, Ser. No. 494,726, Oct. 11, 1965. Application for reissue May 28, 1969, Ser. No. 845,105

Int. Cl. F02m *69/04*

U.S. Cl. 261—36 22 Claims



An induction device including a fluid amplifier adapted to proportion liquid flow between separate outlet passages in response to the flow of a controlling fluid through said amplifier.

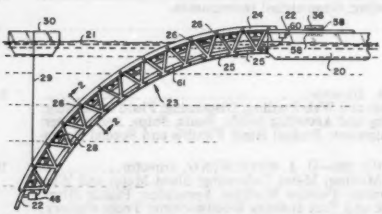
27,088
PIPE-LAYING BARGE WITH ADJUSTABLE PIPE DISCHARGE RAMP

Douglas E. Broussard, Houston, Tex., Donald W. Barry, Centralia, Ill., and Robert B. Kinzbach, Houston, and Stuart G. Kershner, Austin, Tex., assignors to Shell Oil Company, New York, N.Y.

Original No. 3,438,213, dated Apr. 15, 1969, Ser. No. 600,196, Dec. 8, 1966. Application for reissue Jan. 22, 1970, Ser. No. 10,665

Int. Cl. B63b *5/04;* F16l *1/00*

U.S. Cl. 61—72.3 19 Claims



A pipe-laying apparatus for laying pipe on a water floor comprising a pipe-laying vessel having an articulated, adjustable, curved guide for directing a pipeline into the water and adjustment means for selectively varying the curvature of the guide to accommodate differing pipe sizes and water depths.

27,089
PLANAR COAXIAL CIRCUITRY

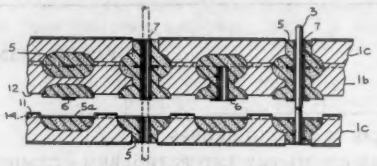
Brian E. Sear, Woodland Hills, Calif., Raymond A. Stephens, Dallas, Tex., and Robert C. Williams, Woodland Hills, Calif., assignors to The Bunker-Ramo Corporation, Stamford, Conn.

Original No. 3,351,816, dated Nov. 7, 1967, Ser. No. 430,321, Feb. 4, 1965. Application for reissue Oct. 24, 1969, Ser. No. 869,978

Int. Cl. H01b *11/06;* H05k *1/14*

U.S. Cl. 317—101 15 Claims

A structure for supporting and interconnecting electrical circuit components. The structure is comprised of a stack of electrically conductive plates. Interconnections, effectively constituting coaxial transmission lines, are formed using the conductive plates as ground planes. Aligned recesses are formed in opposed surfaces of the



plates. Dielectric material is disposed in the recesses with a conductive path being formed between the dielectric material filled recesses. Adjacent plates are bonded together by an electrically conductive bonding material.

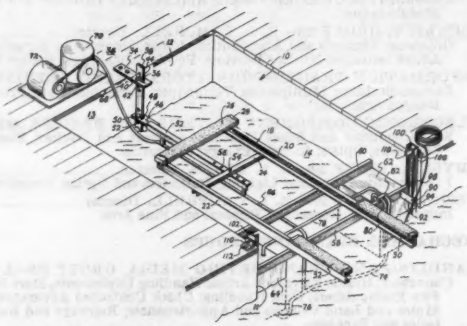
27,090
INDIVIDUAL DRY DOCK FOR BOATS

Henry A. Rutter, Rte. 1, Eucha, Okla. 74342

Original No. 3,362,172, dated Jan. 9, 1968, Ser. No. 435,816, Mar. 1, 1965. Application for reissue Nov. 6, 1969, Ser. No. 871,497

Int. Cl. B63c *1/06;* E02c *3/00*

U.S. Cl. 61—65 10 Claims



An individual dry dock particularly for relatively small water craft wherein a movable frame is pivotally and vertically reciprocally mounted in a boat well filled with water. In a lowered position of the frame the boat may be floated thereon and pontoons are provided for the frame which may be filled with air in order to elevate the frame and boat to a position out of the water. Conversely, air may be withdrawn from the pontoon for lowering the frame and boat into the water.

27,091
TIME RATIO CONTROL AND INVERTER POWER CIRCUITS

Raymond E. Morgan, deceased, late of Schenectady, N.Y., by Agnes T. Morgan, administratrix, Schenectady, N.Y., assignor to General Electric Company

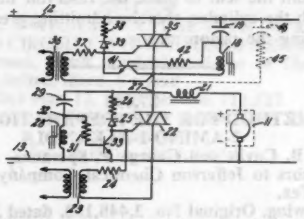
Original No. 3,353,085, dated Nov. 14, 1967, Ser. No. 347,731, Feb. 27, 1964. Application for reissue Apr. 1, 1969, Ser. No. 878,517

Int. Cl. H02m *7/52*

U.S. Cl. 321—43 28 Claims

A family of time ratio control D-C power circuits comprise a load current carrying SCR, triac, diac, or dv/dt

fired SCR which is turned on and commutated off at desired intervals to supply power to the load through a filter inductance. For inductive loads, a coasting diode is in parallel with the load and filter inductance, and for power generating loads the coasting diode is replaced by a dv/dt fired SCR diode combination, triac or diac and a bi-directional conducting load current carrying means is



used to additionally pump power back to the supply. The commutation circuit comprises a commutating capacitor in series with a saturable reactor tuned to series resonance at the commutating frequency, and a blocking circuit renders the gating circuit ineffective during commutating intervals of the commutation circuit. Inverters comprise two cooperating pairs of time ratio control circuits bridge-connected to the load.

27,092

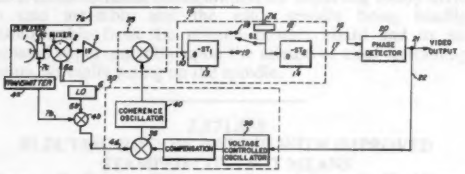
MOVING TARGET INDICATION SYSTEM USING A STAGGERED REPETITION RATE

Francis J. Stifter, Natick, and William W. Shrader, West Newton, Mass., assignors to Raytheon Company, Lexington, Mass.

Original No. 3,417,396, dated Dec. 17, 1968, Ser. No. 679,911, Nov. 1, 1967. Application for reissue Apr. 25, 1969, Ser. No. 822,066

Int. Cl. G01s *9/42*

U.S. Cl. 343—7.7 **9 Claims**



A moving target indication system including a radar receiver operable with a transmitter which radiates pulses at staggered repetition rates. The receiver includes a delay line canceller operative in the intermediate frequency stages. The receiver further includes a first mixing arrangement for rephasing the system by generating a frequency difference signal between each radar return signal and a reference signal. The multiple delay line canceller forms a phase difference signal between each frequency difference signal and a frequency difference signal delayed by at least one transmitter interpulse interval. A second mixing arrangement, also in the receiver, keeps the reference signal coherent in phase with each transmitted pulse and the phase difference signal so that the system is automatically rephased.

27,093

THICK, CURED POLYMETHYL METHACRYLATE ARTICLE AND PROCESS FOR ITS PREPARATION

Donald H. Slocum, Moorestown, N.J., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Original No. 3,405,088, dated Oct. 8, 1968, Ser. No. 434,691, Feb. 23, 1965. Application for reissue Feb. 2, 1970, Ser. No. 11,239

Int. Cl. C08f *29/46, 45/04, 45/06*

U.S. Cl. 260—41 **16 Claims**

The use of at least 40% of an inert filler, e.g., calcium carbonate, calcium sulfate, clay, silica, calcium silicate, etc. along with a hemi-perester of maleic acid catalyst in the polymerization and curing of methyl methacrylate-containing sirups provides a process for forming thick (¼" to 2" or more) articles of polymeric methyl methacrylate within reasonable periods and at moderate temperatures.

27,094

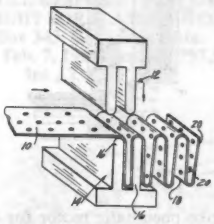
METHOD OF MANUFACTURING PLEATED FILTERS

Nils O. Rosaen, Bloomfield Hills, Borje O. Rosaen, Ann Arbor, and Oscar E. Rosaen, Grosse Pointe, Mich., assignors to Universal Filters, Inc., Hazel Park, Mich.

Original No. 3,465,413, dated Sept. 9, 1969, Ser. No. 589,329, Oct. 25, 1966, which is a continuation-in-part of Ser. No. 532,232, Mar. 7, 1966. Application for reissue Sept. 30, 1969, Ser. No. 868,952

Int. Cl. B23p *9/00*

U.S. Cl. 29—445 **19 Claims**



A method for forming a flat circular pleated filter element includes the steps of using a pair of die members to form pleats in a flat perforated metal sheet, providing an elongated corrugated spacing element between each fold to prevent collapsing, and forming an annular frame of thermosetting material around the periphery of the pleated sheet using a rotating mold member.

27,095

AMMONIUM NITRATE SLURRY BLASTING COMPOSITION CONTAINING SULFUR-SODIUM NITRATE SENSITIZER

Robert B. Clay, Bountiful, and Lex L. Udy, Salt Lake City, Utah, assignors to Intermountain Research and Engineering Company, Inc.

No Drawing. Original No. 3,249,477, dated May 3, 1966, Ser. No. 364,289, May 1, 1964. Application for reissue Jan. 14, 1970, Ser. No. 7,559

Int. Cl. C06b *15/00*

U.S. Cl. 149—41 **13 Claims**

This invention is an improved blasting agent composition of ammonium nitrate in a predominantly aqueous slurry with a sensitizer which is a combination of elemental sulfur and sodium nitrate. This sensitizer is free of self explosive ingredients providing greater safety in handling and processing of the explosive composition.

27,096

DETERGENT COMPOSITION

Arthur Polden Walker, Whitley Bay, England, assignor to The Procter & Gamble Company, Cincinnati, Ohio

No Drawing. Original No. 3,332,876, dated July 25, 1967, Ser. No. 561,374, June 29, 1966, which is a continuation of Ser. No. 423,298, Jan. 4, 1965. Application for reissue Nov. 15, 1968, Ser. No. 808,709

Claims priority, application Great Britain, Oct. 15, 1966, 42,112

Int. Cl. C11d *1/12, 1/18*

U.S. Cl. 252—152 **10 Claims**

A detergent composition having outstanding sudsing and detergent properties. The composition is a synergistic ternary mixture of olefin sulfonates, alkyl, benzene sulfonates and alkyl ether sulfates.

27,097

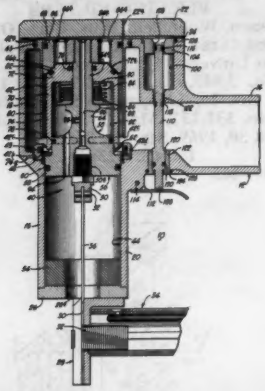
FLUID MOTOR HAVING A SUPPLY-AND-EXHAUST VALVE CARRIED BY THE PISTON

Edward J. Novak, Franklin Park, Ill., assignor to Fastener Corporation, Franklin Park, Ill.

Original No. 3,405,602, dated Oct. 15, 1968, Ser. No. 514,502, Dec. 17, 1965. Application for reissue Mar. 27, 1969, Ser. No. 817,608

Int. Cl. F15b *13/042, 15/17, 11/15*

U.S. Cl. 91—28 25 Claims



A single stroke pneumatic motor for a fastener driving tool comprising a housing defining a reservoir for pressurized fluid, a cylinder in the housing, and piston means slidably mounted in the cylinder including a piston valve means and a valve seat thereon. The piston valve means are movable bodily with the piston means and are movable against the seat for normally closing the communication between the reservoir and one end of the cylinder. Means are provided for moving the piston valve means away from the seat to place the reservoir in communication with the cylinder, thereby admitting pressurized fluid for driving the piston means.

27,098

METHOD FOR THE PREPARATION OF 2-AMINO-1-ALKANOLS

Stanley B. Cavitt and George P. Speranza, Austin, Tex., assignors to Jefferson Chemical Company, Inc., Houston, Tex.

No Drawing. Original No. 3,448,153, dated June 3, 1969, Ser. No. 553,726, May 31, 1966. Application for reissue Apr. 6, 1970, Ser. No. 26,179

Int. Cl. C07c *91/02, 95/02, 97/02*

U.S. Cl. 260—584 4 Claims

The reductive amination of 2-keto-1-alkanols produces 2-amino-1-alkanols. The products prepared in accordance with the invention are emulsifying agents that find application in the preparation of floor polishes, shoe polishes, automobile cleansers-polishes, emulsion paste waxes, and substituted piperazines by means of a cyclic reductive amination reaction. Further, alkylene oxides may be reacted with the amino-alkanols to yield nitrogen-containing polyether polyols useful in the preparation of polyurethanes.

PATENTS

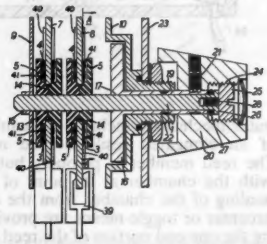
GRANTED MARCH 23, 1971

ELECTRICAL

3,571,534
ELECTRIC SWITCH STRUCTURE WITH IMPROVED PRINTED CIRCUIT CONTACT BOARD ASSEMBLY

John R. Ashman, Ilford, England, assignor to The Plessey Company Limited, Ilford, England

Filed Mar. 12, 1968, Ser. No. 712,527
Claims priority, application Great Britain, Mar. 15, 1967, 12,054/67
Int. Cl. H01h *19/58, 19/64*
U.S. Cl. 200—11 10 Claims



A rotary switch having a rotor comprising at least one wiper assembly carried by a rotor spindle and having a stator comprising at least one printed contact board which has contacts thereon selectively engageable by said wiper assembly and through which the rotor spindle extends, said wiper assembly being slidably mounted on the rotor spindle which has a cross-sectional configuration for imparting rotary drive to said assembly and the rotor spindle being readily withdrawable from the printed contact board and its associated wiper assembly upon the release of axial restraining means normally acting on the spindle.

3,571,535
ELECTRIC ROTARY SWITCH WITH IMPROVED STAMPED CONTACT MEANS

Thomas R. Beaver, Elkhart, Ind., and Kenneth C. Allison, Crystal Lake, Ill., assignors to CTS Corporation., Elkhart, Ind.

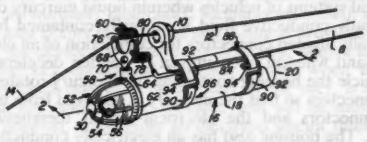
Filed Mar. 10, 1969, Ser. No. 843,864
Int. Cl. H01h *19/58*
U.S. Cl. 200—11 13 Claims

An electric switch having a plurality of individual spaced contacts and a common contact lying in the same plane and supported by a stationary contact carrier of insulating material. Certain of the individual spaced contacts and at least a portion of the common contact have edge portions equally spaced from an elongated surface of the stationary contact carrier. Depending upon the switching requirements, the individual spaced contacts and the common contact can be provided with integral terminal means for connecting the contacts into an electrical circuit or some of the individual spaced contacts can be provided with integral stamped inductance means. A movable contact carrier of insulating material is movable along the elongated surface of the stationary contact carrier and a bridging contactor constrained to move with the movable contact carrier selectively connects or shorts certain individual spaced contacts. The bridging contactor for the electric switch is blanked from sheet material with a plurality of contact portions and stored for future use. Depending upon the application of the switch, the extra contact portions are severed from the contactor which is then curved and ready for assembly to produce the electric switch.

3,571,536
IMPROVED PULL-RESPONSIVE BITE-SIGNALLING LIGHT FOR FLASHLIGHTS

Virgil H. Sparks, Box 343, Chickasha, Okla.

Filed Feb. 7, 1969, Ser. No. 797,517
Int. Cl. F21v *23/04*
U.S. Cl. 200—60 12 Claims

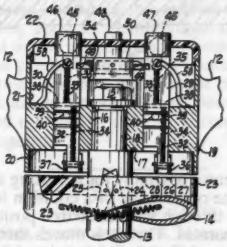


A flashlight is equipped with circuit make and break means so constructed and cooperatively oriented with the coacting battery case that when a fish bites, the pull which is exerted acts on the movable contact, in a manner to (1) close the circuit (2) bring the signal light into play and (3) alert the fisherman. Several similar but structurally distinct circuit make and break adaptations are herein disclosed. Means is provided for mounting the flashlight on a rod, a pole, or where a trotline is used, on a vertical stake. The light bulb is provided with novel inner and outer caps, the outer cap being provided with distinguishably and selectively usable colored segments, that is, where a plurality of individual bite signals are grouped adjacent each other.

3,571,537
AUTOMOBILE TURNING-LIGHT SWITCH

Darlo J. Cook, 193 Hawthorn Drive, Painesville, Ohio, and Thomas E. Boyance, 8431 O'Melveny Ave., Sun Valley, Calif.

Filed Jan. 7, 1970, Ser. No. 1,097
Int. Cl. H01h *3/16*
U.S. Cl. 200—61.38 4 Claims

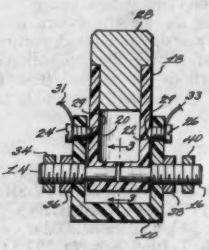


An automobile directional signal switch having signal control buttons positioned at the center of the automobile steering wheel.

3,571,538
INERTIALLY OPERATED SAFETY SWITCH

William O. Swanson, 303 Leslie Lane, Columbia, Mo.

Continuation-in-part of application Ser. No. 829,911, June 3, 1969, now abandoned. This application Sept. 30, 1969, Ser. No. 862,298
Int. Cl. H01h *35/14*
U.S. Cl. 200—61.47 10 Claims

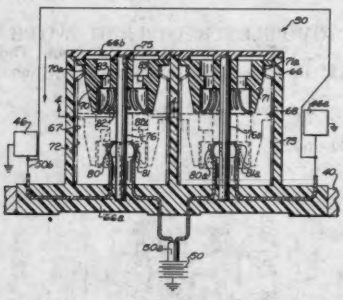


A gravity or inertially operated safety switch for use with electrical systems of vehicles wherein liquid mercury or other electrically conductive fluid is normally contained between two axially aligned connectors for completion of an electrical circuit and wherein upon impact or sudden deceleration of the vehicle the housing containing the mercury rotates about the connectors so that the mercury is removed from between the connectors and the electrical circuit therebetween is broken. The housing also has an electrically conductive wire embedded therein for normally completing a second circuit through two detents whereby this second circuit is opened when the housing rotates upon impact and the wire is no longer in contact with the detents.

3,571,539
COLLISION SENSOR

Herman Kaiser, and George W. Goetz, Detroit, Mich., assignors to Eaton Yale & Towne Inc., Cleveland, Ohio

Filed Aug. 20, 1968, Ser. No. 753,946
Int. Cl. H01h *35/14*
U.S. Cl. 200—61.53 14 Claims

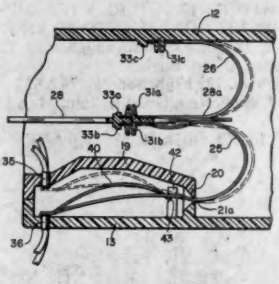


An improved sensor assembly for actuating a vehicle safety apparatus upon the occurrence of a collision includes a mass which is movable through a distance to a position for actuating the safety apparatus. The mass moves through the aforementioned distance when the vehicle is involved in a collision which could result in injury to an occupant of the vehicle due to impact with a structural part of the vehicle. The mass will not move through the aforementioned distance as a result of the vehicle encountering normal road conditions or during vehicle braking.

3,571,540
RESILIENT REED TYPE ACTUATOR MECHANISM

George B. Richards, P.O. Box 278, Highland Park, Ill.

Filed Sept. 6, 1967, Ser. No. 665,923
Int. Cl. H01h *13/36*
U.S. Cl. 200—67 23 Claims

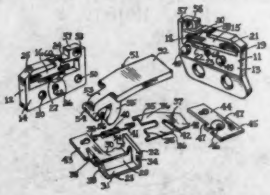


An actuator mechanism includes a chamber with one end portion of an elongated resilient reed member disposed therein. The reed member is pivotally but nonshiftably associated with the chamber at its point of entry therein to facilitate sealing of the chamber from the external environment. Overcenter or toggle means are provided for yieldably maintaining the one end portion of the reed member in either of two spaced positions. Several preferred arrangements are disclosed for effecting a crisp, toggle action on angular displacement of the one reed end portion between its spaced positions irrespective of the rate of movement of the remaining reed end portion. A variation of the above construction which is especially well suited for use as a miniature electrical switch is also disclosed.

3,571,541
SNAP ACTION SWITCH

Michael F. Bedocs, and Fred N. Anderson, Highland Park, Ill., assignors to Cherry Electrical Products Corporation, Highland Park, Ill.

Filed Feb. 17, 1969, Ser. No. 799,723
Int. Cl. H01h *13/28*
U.S. Cl. 200—67 1 Claim



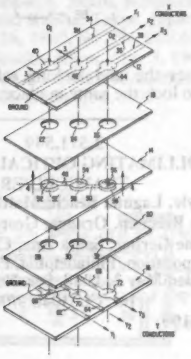
A switch of the snap action type wherein a switch blade is pivotally carried by a combined bracket and terminal member which constitutes a part of the switch actuating overcentering mechanism, all of which has a construction whereby it may be easily and economically assembled within the switch housing. The combination bracket and terminal member is generally formed to provide spaced parallel base sections, with one of the base sections including a terminal portion disposed in coplanar relationship and extending laterally therefrom through one sidewall of the switch housing. The sidewalls of the switch housing each provide shelf members and retaining ribs positioned about the laterally disposed terminal portion as well as the medial portions of the terminal member for mounting the same thereto.

3,571,542

FLUID LOGIC CONTROLLED ELASTIC DIAPHRAGM SWITCH MATRIX WITH CROSS POINT SHIELDING

Thomas F. Madden, New Canaan, Conn.; Lawrence A. Tate, Irvington, and Alfred Weiss, Ossining, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 12, 1969, Ser. No. 849,422
Int. Cl. F15c 1/10; H01h 35/34
U.S. Cl. 200—83 9 Claims



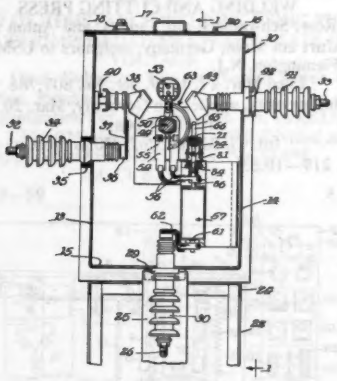
The fluid logic controlled elastic diaphragm switch matrix is formed of multiple elastic diaphragms having conductive surface portions in alignment with apertures carried by interspersed rigid sheets with the central elastic diaphragm carrying opposed and insulated conducting surfaces which are grounded when the switch point is open to act as shields. The matrix coordinate input pulses are amplified at each matrix unit to verify proper operation of the switch actuating fluid amplifier.

3,571,543

MULTIPLE POSITION VACUUM INTERRUPTER SWITCHING DEVICE

Gordon O. Perkins, Flossmoor, Ill., and Howard E. Swanson, Chicago, Ill., assignors to G & W Electric Specialty Company, Blue Island, Ill.

Filed Sept. 30, 1968, Ser. No. 763,809
Int. Cl. H01h 33/66
U.S. Cl. 200—144 6 Claims



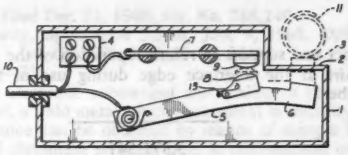
The operating and programming mechanism of the invention is designed to actuate the contacts of a vacuum switch and the contacts of a selector switch in a predetermined sequence. The vacuum switch contacts are connected in series with the contacts of the selector switch and a cam is provided as the programming means. The cam converts a portion of the operator output into linear motion so that the vacuum switch contacts are caused to close after the selector switch contacts close and are opened before the selector switch contacts open.

3,571,544

MAGNETIC KEY OPERATED SWITCH FOR ELECTRICALLY OPERATED HAND TOOLS

Hilary William Sheehan, 1408 Leneva Lane, Pasadena, Tex.

Filed Oct. 21, 1968, Ser. No. 769,189
Int. Cl. H01h 9/06, 36/00, 1/36
U.S. Cl. 200—157 2 Claims



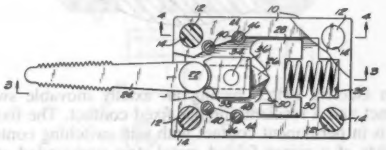
This invention relates to a switch for electrically operated hand tools, and the like, wherein the contact points of the switch are normally maintained yieldably separated, and one arm of said points is movable, and a ring is provided for the user of the device having a magnetized key, shaped to fit the particular key opening of the tool, so that when the key, mounted on a ring worn on a finger of the user, is inserted into the key opening, the movable arm will be moved into closed position, completing an electrical circuit through the motor of the tool, and upon removal of the key, for any reason, the tool will be immediately deactivated.

3,571,545

TOGGLE SWITCH WITH PIVOTAL SHORTING BAR BRIDGING STATIONARY CONTACT PINS, AND SLIDABLE CAM BLOCK DETENT MEANS

Edward G. Haderer, Newtown Square, Pa., assignor to Controls Company of America, Melrose Park, Ill.

Filed Nov. 13, 1968, Ser. No. 775,381
Int. Cl. H01h 1/22, 1/20, 23/30
U.S. Cl. 200—166 5 Claims



The point of the pivoted toggle lever acts on the cam surfaces of the spring biased slidable cam to obtain the desired action depending upon the cam configuration. The shorting bar is mounted on the toggle lever for limited pivoting action to insure equal pressure against the contact pins at the extremes of motion. The pins are brought out of the case for simple connection to printed circuit boards. All parts are mounted in and retained by the case halves which are identical and snap together.

3,571,546

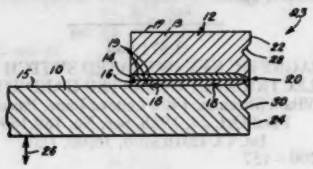
CONTACT MEMBER

Charles D. Sedlak, North Attleboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 19, 1968, Ser. No. 785,325
Int. Cl. H01h 1/02
U.S. Cl. 200—166 16 Claims

An electrical contact member including an electrical contact and a contact support which are secured together by

welding, soldering or the like to form an interface between the contact and support. The contact member is mechanically reinforced along the edge of this interface between the

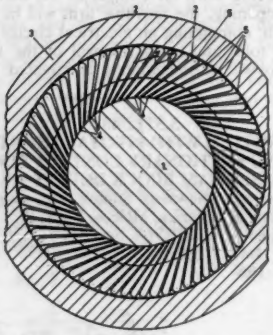


contact and support to retard separation of the contact and support at the interface edge during use of the contact member.

3,571,547
ELECTRIC CURRENT CONTACT

Rintje Boersma, Harmelen, and Gijsbert W. Irik, Bilthoven, Netherlands, assignors to N.V. "COQ", Utrecht, Netherlands

Filed June 4, 1969, Ser. No. 830,345
Claims priority, application Netherlands, June 5, 1968, 68.07852
Int. Cl. H01h *1/48*
U.S. Cl. 200—166 **3 Claims**



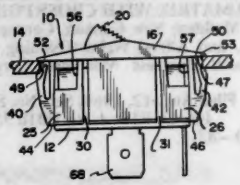
An electric switch having an axially movable switching contact and a resilient annular fixed contact. The fixed contact is in permanent contact with said switching contact and consists of a zigzag folded metal strip surrounded and supported by an annular holder. The metal strip is bent in the shape of a ring which snugly encloses the switching contact and is constituted by a circular series of pairs of contact lips.

3,571,548
SNAP-IN MOUNTING FOR AN ELECTRICAL SWITCH

Thomas F. Osika, Gary, Ind., assignor to McGill Manufacturing Company, Inc., Valparaiso, Ind.

Filed Apr. 1, 1969, Ser. No. 812,114
Int. Cl. H01h *9/02*
U.S. Cl. 200—168 **3 Claims**

Apparatus for attaching an electrical switch case to a mounting plate includes a cover member for the switch casing, having an upper bezeled portion which is supported by the mounting plate. Switch case locking tabs are molded integral with the bezel and extend downward through an aperture in the mounting plate. The switch case is connected to the cover member by snapping the locking tabs thereabout. Integral with each of the end locking tabs extend resilient arms for mounting the cover member with the switch casing positioned therein to the mounting plate. The end of each of the arms has a groove therein which engages the corresponding edge of the aperture in the mounting plate thereby resiliently securing the cover to the plate. Compression of the

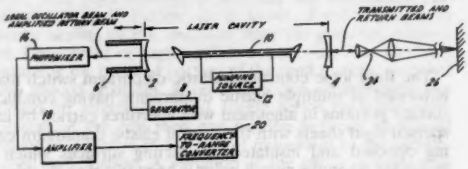


arms also biases the end locking tabs tightly against the switch casing to lock the same in place.

3,571,549
AUTOCOLLIMATING OPTICAL HETERODYNE TRANSCEIVER

Walter M. Doyle, Laguna Beach; Matthew B White, Newport Beach; Elias Reisman, Orange; George Joseph Galassi, and Wesley Duane Gerber, Santa Ana, Calif., assignors to Philco-Ford Corporation, Philadelphia, Pa.

Filed May 3, 1968, Ser. No. 726,315
Int. Cl. H04b *9/00*
U.S. Cl. 200—199 **11 Claims**

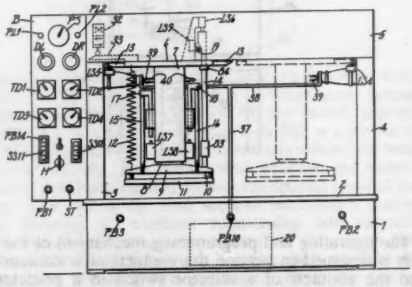


A laser system that utilizes a single laser as a transmitter, a local oscillator and a preamplifier. This system also provides automatic collimating of the transmitter and local oscillator light beams. The frequency of the local oscillator beam and the frequency of the transmitted beam are made different so that a difference frequency beat note can be obtained. This beat note is indicative of the information gathered by the system.

3,571,550
CONTROL SYSTEM FOR A HIGH-FREQUENCY WELDING AND CUTTING PRESS

Robert Rose, Schwalbach am Taunus, and Anton Muhlbach, Frankfurt am Main, Germany, assignors to USM Corporation, Flemington, N.J.

Filed Mar. 17, 1969, Ser. No. 807,786
Claims priority, application Germany, Mar. 20, 1968, P 17 78 008.4
Int. Cl. B23k *13/02*; **H05b** *5/00*
U.S. Cl. 219—10.53 **4 Claims**



A welding and cutting press having a platen movable transversely over its work support to plural working positions is

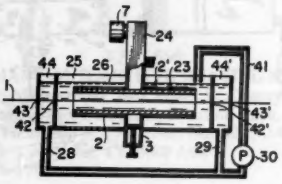
provided with a control comprising a plurality of sets of adjustable control means for establishing different values of operating conditions at said plurality of working positions of the press.

3,571,551

HIGH FREQUENCY HEATING APPARATUS

Naoyuki Ogasawara, Tokyo; Takao Namiki, Chiba-ken, and Katsutoshi Sone, Chiba-ken, Japan, assignors to Furukawa Denki Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 26, 1969, Ser. No. 810,650
Claims priority, application Japan, Apr. 3, 1968, Nov. 13, 1968, Jan. 24, 1969, 43/21465;43/83092;44/4722
Int. Cl. H05b *9/06, 5/00*
U.S. Cl. 219—10.55 4 Claims



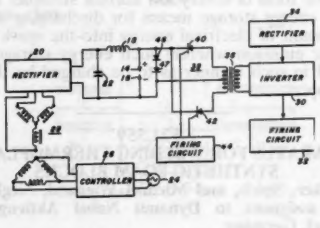
An apparatus for noncontact heating of a continuously running metal wire with microwave power, which consists of a high loss transmission line such as coaxial line, strip line, or slab line, or its resonator, with the wire serving as an inner conductor. A bare or insulated wire to be heated and a conductor surrounding the wire together constitute a high loss transmission line such as a coaxial line, a strip line or a slab line. Such a transmission line is shorted at both ends thereof to form a resonator. The transmission line or resonator is fed with a high frequency power from a high frequency power source such as magnetron through a waveguide system connected to the transmission line or resonator in noncontacting relationship to the wire. Heat that develops either by the resistance loss in the wire or by the dielectric loss in the insulation layer is used for annealing of the wire or curing of the insulation layer.

3,571,552

METHOD OF RESISTANCE WELDING USING PULSED DC SUPERIMPOSED OVER STEADY STATE DC VOLTAGE

Kenneth E. Opal, Oakmont, Pa., assignor to Power Control Corporation, Pittsburgh, Pa.

Original application Oct. 10, 1968, Ser. No. 766,533, now Patent No. 3,521,025, dated June 21, 1970. Divided and this application Feb. 24, 1970, Ser. No. 13,695
Int. Cl. B23k *3/06*
U.S. Cl. 219—59 4 Claims



Apparatus for welding, particularly resistance seam welding, wherein the voltage applied across the weld comprises a steady state direct current voltage having superimposed thereon an alternating current voltage or a chopped direct current voltage. This provides a true diffusion weld, results in a substantially uniform grain structure across the weld, and enables extremely high welding speeds.

3,571,553

BAND ELECTRODE SUBMERGED ARC WELDING OF CHROMIUM STAINLESS STEEL AND A MATERIAL USED IN SAID WELDING

Tomokazu Godai; Makoto Tomita, and Osamu Tanaka, Kamakura-shi, Japan, assignors to Kobe Steel, Ltd., Kobe, Japan

Filed Dec. 31, 1968, Ser. No. 788,240
Claims priority, application Japan, Jan. 9, 1968, 43/966
Int. Cl. B23k *9/18, 25/00, 35/00*
U.S. Cl. 219—73 1 Claim

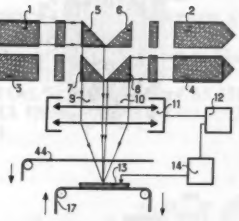
The band electrode submerged arc-welding of chromium stainless steel, a weld metal which is excellent in ductility and crack resistance can be obtained by means of using a band electrode of chromium stainless steel in combination with a flux containing 25 to 50 percent calcium carbonate, 30 to 50 percent alumina, 1 to 10 percent fluorite, and 1 to 10 percent magnesia, said electrode and/or flux being blended with aluminum, titanium, columbium, nitrogen, chromium, manganese, and nickel or cobalt, so that the weld metal contains these elements in the ratio of 0.015 to 0.15 percent aluminum, 0.0025 to 0.22 percent titanium, 0.35 to 2.8 percent columbium, 0.01 to 0.075 percent nitrogen, 8.5 to 25 percent chromium, 0.15 to 2.0 percent manganese, and less than 2.8 percent nickel or cobalt.

3,571,554

LASER TOOL

Jean Baujoin, Meudon, France, assignor to Compagnie Generale D'Electricite, Paris, France

Filed Jan. 15, 1969, Ser. No. 791,411
Claims priority, application France, Jan. 15, 1968, 135,924
Int. Cl. B23k *9/00*
U.S. Cl. 219—121 2 Claims



An optical system employed by a laser tool having multiple laser heads for combining corresponding laser beams and concentrating the same at a single point with a fine film of material disposed between the point and the optical system to protect the same.

3,571,555

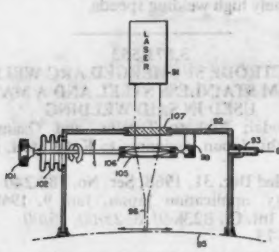
LASER MACHINING APPARATUS

Charles H. Townes, Cambridge; Raymond Y. Chiao, Boston, and Elsa M. Garmire, Cambridge, Mass., assignor to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration

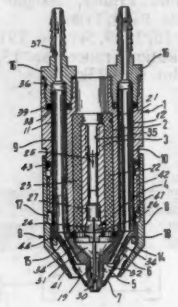
Original application Oct. 11, 1965, Ser. No. 494,739, now Patent No. 3,556,634, dated Jan. 19, 1971. Divided and this application Jan. 24, 1969, Ser. No. 822,088
Int. Cl. B23k *27/00*
U.S. Cl. 219—121 4 Claims

Apparatus for machining a workpiece by electromagnetic energy, preferably laser energy. The apparatus includes a dielectric through which a laser is directed toward the work-

piece. At a critical power and wavelength, the dielectric functions as an optical waveguide preventing beam divergence. The apparatus further includes an optical element and position control means for the optical element.

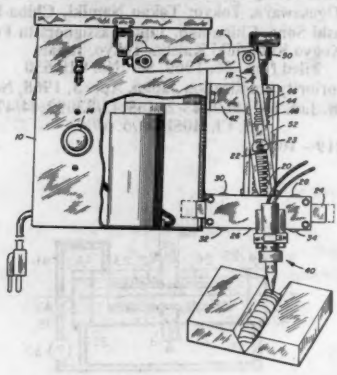


3,571,556
PLASMA WELDING TORCH
Friedrich Wustner, Wolfratshausen, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Germany
Filed Mar. 21, 1969, Ser. No. 809,063
Claims priority, application Switzerland, Apr. 8, 1968, 5,208/68
Int. Cl. B23k *9/00*
U.S. Cl. 219—121 **6 Claims**



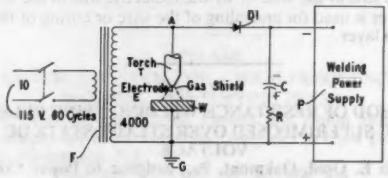
A plasma welding torch or burner generally including a cylindrical body portion, an electrode carried by the body, a plasma gas nozzle, a protective gas nozzle concentrically disposed around the plasma gas nozzle and engaging the body in a manner to clamp the plasma nozzle in position on an end portion of the body. The body has a pair of elongated apertures formed therethrough and aligned with a longitudinal axis thereof. A pair of conduits are secured to the plasma nozzle and form inlet and outlet passageways for directing coolant through a coolant chamber in the plasma gas nozzle. The pair of conduits are carried within the elongated apertures formed in the body, and a pair of connectors overlie an end portion of the conduits to provide connection means to a source of coolant and to seal the conduits in position. The body portion is further characterized by another elongated aperture formed parallel of the longitudinal axis and opening into an annular chamber formed between the protective gas nozzle and an outer surface of the body to provide passageway means for directing protective gas through the protective gas nozzle. Plasma gas passes through a passageway formed in a sleeve disposed coaxially of the body and enters the plasma nozzle through lateral slots formed in a collet received in the sleeve and securing the electrode onto the body.

3,571,557
WELDING TORCH OSCILLATOR
Lamar T. Valentine, Tulsa, Okla., assignor to Welding Process Company, Tulsa, Okla.
Filed Apr. 1, 1969, Ser. No. 812,042
Int. Cl. B23k *9/00*
U.S. Cl. 219—130 **1 Claim**



A welding torch oscillator includes linkage from an electric motor drive. One portion of the linkage includes a slot within which is a movable fulcrum, the position of which varies the ultimate width of torch oscillation. The fulcrum is a bearing member which is attached to a nut through which a fixed threaded shaft is rotatable. A hand knob attached to the shaft permits immediate adjustment to a desired oscillation.

3,571,558
APPARATUS FOR ARC STARTING
John A. Hogan, Jr., Somerset, N.J., assignor to Union Carbide Corporation
Filed July 24, 1968, Ser. No. 747,354
Int. Cl. B23k *9/10*
U.S. Cl. 219—131 **6 Claims**

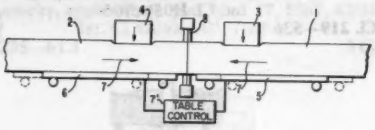


Apparatus for starting an arc between an electrode and a workpiece comprising means for impressing a high DC voltage across the gap formed between the electrode and the work, the voltage having a sufficient magnitude to establish a spark in the form of a very low current streamer and means including energy storage means for discharging a predetermined amount of electrical energy into the spark to initiate thermionic emission wherein such energy storage means is connected in such manner as to be charged by the welding power supply.

3,571,559
APPARATUS FOR WELDING THERMOPLASTIC SYNTHETIC FOAM BLOCKS
Josef Becker, Spich, and Michael Wienand, Siegburg, Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany
Filed Dec. 23, 1968, Ser. No. 786,081
Claims priority, application Germany, Dec. 22, 1967, P 17 04 012.9
Int. Cl. H05b *1/00*
U.S. Cl. 219—243 **15 Claims**

Apparatus for welding blocks or other molded forms of

synthetic foam materials, such as, for example, thermoplastic polymers, including a welding device incorporating wedge-shaped separating means disposed in advance of a heating wire for traversing the desired location of the seam, whereby



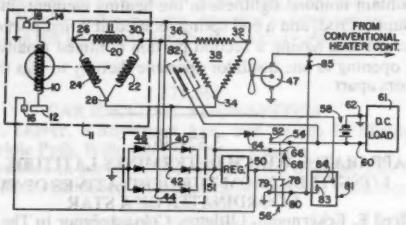
the heating wire is able to pass through the location of the seam substantially unobstructed by forces of friction and the like between the wire and the surfaces of the forms to be welded.

3,571,560

AUXILIARY AUTOMOTIVE HEATING SYSTEM

Ole K. Nilssen, Bensenville, and James R. Cherry, Barrington, Ill., assignors to Motorola, Inc., Franklin Park, Ill.

Filed May 8, 1969, Ser. No. 823,134
Int. Cl. B60l *1/02*
U.S. Cl. 219—279 **9 Claims**



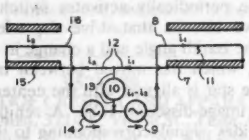
An electrical quick heat system for instantly supplying heat from resistive heating elements to the passenger compartment of an automotive vehicle. The quick heat system includes a heavy duty alternator, which is always directly connected to the resistive heating elements, and a switching mechanism for simultaneously bypassing the regulator to operate the alternator in its unregulated mode and for disconnecting the battery along with the automotive circuits from the alternator so that they are not subjected to the increased amplitude of the unregulated voltage.

3,571,561

CIRCUIT FOR DETECTING ABNORMALITY IN ELECTRIC HEATING APPARATUS OF PIPE LINES

Masao Ando, Yokohamashi, Japan, assignor to Chisso Corporation, Osaka, Japan

Filed Mar. 10, 1969, Ser. No. 805,480
Claims priority, application Japan, Mar. 8, 1968, 43/15081
Int. Cl. H05b *3/00*
U.S. Cl. 219—300 **6 Claims**



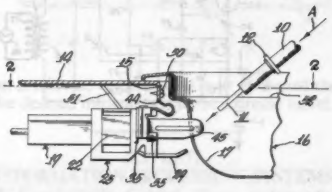
An abnormality-detecting circuit in a long electric heat-generating apparatus to be attached on pipelines which circuit is so arranged that abnormality can be detected by electrically dividing said heat-generating apparatus into two portions, supplying to each electrically divided portion of said heat-generating apparatus, voltages of the same phase, which are approximately proportional to the length of said divided portion so as to flow as equal a current through each divided portion as possible, and measuring the difference of the above-mentioned two currents which are normally set as equal as possible.

3,571,562

TERMINAL ASSEMBLIES FOR ELECTRIC HEATING ELEMENTS

Donald M. Cunningham, Pittsburgh, Pa., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Apr. 22, 1969, Ser. No. 818,276
Int. Cl. H01r *3/06*
U.S. Cl. 219—451 **11 Claims**



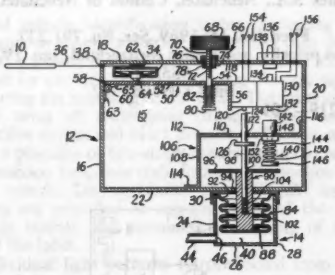
A plug-in terminal assembly for an electric heating element supported in an opening in a stove top, the assembly comprising a rigid sheet metal bracket straddling a dielectric terminal block, and a connecting member of spring sheet metal straddling the bracket and having a top connected to the bracket and formed with a spring loop extension which terminates in an ear connected to the stove top adjacent the stove opening. The sides of the connecting member have arm extensions which form grounding springs for grounding the heating element as it is plugged into the dielectric terminal block.

3,571,563

COMBINED AUTOCLAVE AND CONTROL SYSTEM AND METHOD THEREFOR

Robert J. Shulz, Brookfield, Ill., assignor to Vischer Products Company, Chicago, Ill.

Filed Oct. 7, 1968, Ser. No. 765,351
Int. Cl. H05b *1/02*; **A61l** *3/00, 3/02*
U.S. Cl. 219—491 **9 Claims**



A steam autoclave containing a steam chamber and heater for generating steam to fill said steam chamber in combination with a control system therefor. The control system automatically energizes the heater in response to a combined signal, incorporating both temperature and pressure measurements, when the combined signal is below a predetermined level and automatically deenergizes the heater when the combined signal exceeds said predetermined level. The control system also deenergizes the heater in response to

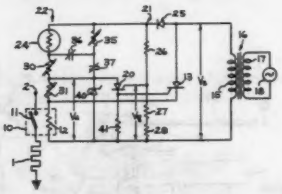
signals indicating maximum individual predetermined levels of temperature or pressure, and thereby acts as a temperature and pressure override safety system for the autoclave. Deenergization of the heater by one of the override controls requires manual reenergization of the heater.

3,571,564

MULTILEVEL TEMPERATURE CONTROL CIRCUIT

Stanley B. Welch, Louisville, Ky., assignor to General Electric Company

Filed Nov. 29, 1968, Ser. No. 779,869
Int. Cl. H05b *1/02*
U.S. Cl. 219—501 **6 Claims**



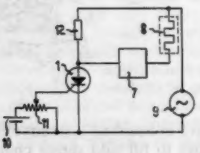
A solid-state circuit for maintaining the temperature of an oven at a first or second selected level. A voltage divider supplies a temperature-dependent voltage to a threshold switching device such as a silicon controlled switch. When the oven temperature is below a first set point, the SCS is turned on and gates an SCR connected in series with a hot wire relay. The hot wire relay biases a pair of contacts closed to energize the oven heating element. When oven temperature rises above the set point, the voltage applied to the SCS decreases below the threshold voltage. The SCR is no longer gated, and the hot wire relay cools so that the relay contacts open. A single switch is employed to connect a differing resistance into the voltage divider to change the control circuit set point. In addition, the hot wire relay may be included in the voltage divider and act as a thermistor upon being energized and deenergized. In this manner, fluctuation of the voltage applied to the SCS at the threshold level is prevented and rapid cycling of the relay cannot occur.

3,571,565

ELECTRONIC THERMOSTAT

Brian Edward Hasler, Neuchatel, Switzerland, assignor to Ebauches S.A., Neuchatel, Canton of Neuchatel, Switzerland

Filed Jan. 15, 1969, Ser. No. 791,227
Claims priority, application Switzerland, Jan. 19, 1968, 885/68
Int. Cl. H05b *1/02*
U.S. Cl. 219—501 **6 Claims**



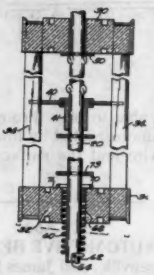
An electronic thermostat having a thermosensitive semiconductor element in its measuring circuit, the hysteresis of the thermostat being substantially reduced by pulsating or alternating signals in said semiconductor element.

3,571,566

ELECTRIC RESISTANCE HEATER WITH A TENSION COIL SPRING

John C. Kuzara, Columbia, Mo., assignor to McGraw-Edison Company, Elgin, Ill.

Filed Aug. 27, 1969, Ser. No. 853,329
Int. Cl. H05b *3/06*
U.S. Cl. 219—536 **9 Claims**



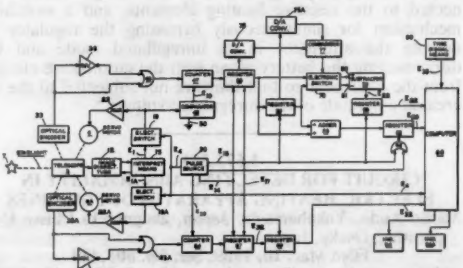
In an electric resistance heater having a heating element extended between spaced insulators, improved means for supporting the insulators at variably spaced distances to maintain nominal tightness in the heating element, including a support rod, and a coil spring secured at a first portion over the rod and having a second portion confined axially within an opening in one insulator operable thereby to bias the insulators apart.

3,571,567

APPARATUS WHICH DETERMINES LATITUDE AND LONGITUDE FROM THE DERIVATIVES OF TWO COORDINATES OF A STAR

Alfred E. Eckermann, Littleton, Colo., assignor to The Bendix Corporation

Filed Dec. 19, 1969, Ser. No. 889,866
Int. Cl. G01c *17/34;* **G01j** *1/20;* **G06f** *15/50*
U.S. Cl. 235—150.271 **14 Claims**

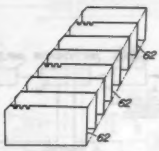


An astronavigational system comprising a telescope which is automatically controlled to periodically track a star. A pulse source periodically activates switching means which control servo circuits that drive the telescope through a change in the zenith angle and a change in the azimuth angle of the star, which has moved between trackings, until an image of the star is aligned with the center of the photosurface of an image-dissector tube. A zenith-angle-measuring circuit provides signal corresponding to the average zenith angle and the change in zenith angle for the time period between trackings of the star. An azimuth-angle-measuring circuit provides a signal corresponding to the change in azimuth angle for the time period. A computer uses the signals from the measuring circuits and a time-base signal from the pulse source to compute longitude and latitude.

3,571,568
CARD PROCESSING SYSTEM

Shu Ono, Yamato-shi; Eiichi Goto, Koganei-shi, and Tadao Mitsui, Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 12, 1968, Ser. No. 712,455
Claims priority, application Japan, Mar. 17, 1967, 42/16381
Int. Cl. G06k 1/05, 1/18
U.S. Cl. 235—61.1 3 Claims

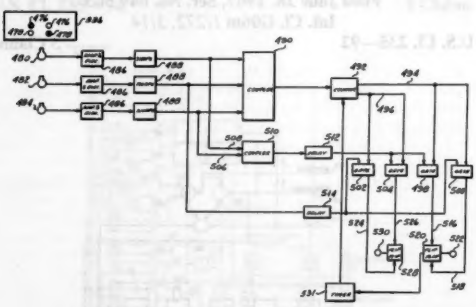


This specification discloses a card processing system wherein use is made of partition cards having open apertures formed in the periphery thereof as means for making distinctions between a plurality of card groups to be distinguished from each other in an attempt to take out outputs corresponding to the perforations of said plurality of card groups in an electronic computer system including at least a central processing unit, a card-punch controlling unit and a card punch, thereby reducing the operator's intervention and eliminating the use of any expensive auxiliary machine.

3,571,569
CAR IDENTIFICATION SYSTEM

Eric W. Leaver, 4 Royalcrest Ave., and George R. Mounce, 18 Bridle Path, Willowdale, Ontario, Canada

Continuation-in-part of application Ser. No. 670820, July 9, 1957, now abandoned. This application Oct. 15, 1962, Ser. No. 230,568
Int. Cl. G06k 7/00
U.S. Cl. 235—61.11 18 Claims



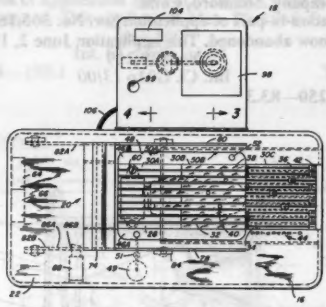
A car identification system in which spaced sources of energy carried by the car are read by detecting heads disposed on the railway bed or roadway over which the car passes. One form produces rod, indication of both direction of movement and the speed of the car.

3,571,570
THEFTPROOF CREDIT CARD APPARATUS

Noel William Taulman, 3714 E. Virgin St., Tulsa, Okla.

Filed June 18, 1969, Ser. No. 834,464
Int. Cl. G06k 7/10
U.S. Cl. 235—61.7 4 Claims

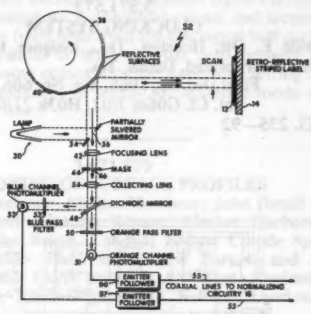
In an apparatus for the recordation of credit sales to be used in conjunction with a card having a plurality of apertures therein, light rays passing through apertures in a housing member and apertures on the card, said apertures being in registered alignment, impinge upon a photosensitive receptacle which triggers an electrical circuit whereby a roller mechanism is allowed to be passed over said card thereby imprinting the desired information upon a credit ticket.



3,571,571
INFORMATION PROCESSING SYSTEMS

Christos B. Kapsambelis, Canton, Mass., assignor to Sylvania Electric Products Inc.

Filed Oct. 14, 1968, Ser. No. 767,213
Int. Cl. G06k 7/12
U.S. Cl. 235—61.11 12 Claims



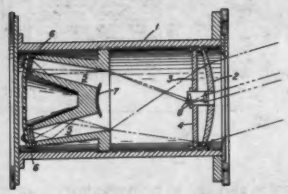
A coded vehicle identification system including a label-data recognition arrangement for recognizing data derived in response to scanning a coded retroreflective label affixed to a vehicle and for preventing the processing of noise signals occurring during the scanning of the label. The label comprises a vertical array of rectangular orange, blue, and white retroreflective stripes and black nonretroreflective stripes arranged in a plurality of two-stripe combinations to represent, in a two-position base-four code format, information pertaining to the vehicle. Distinguishable coded START and STOP stripe-pairs are provided at opposite ends of the array to respectively initiate and terminate processing of the data content of the label.

The individual light patterns retroreflected from the plurality of coded pairs of stripes, in response to being successively scanned, are converted into corresponding coded electrical signals and entered sequentially, by means of shift pulses initiated by the coded electrical signals, into successive stages of a plurality of storage shift registers. A label-data recognition arrangement is provided for allowing the coded electrical signals stored in the shift registers to be applied to a readout apparatus if the coded signals are recognized to be label data. If, at any time, however, a signal is recognized not to be label data, for example, a noise signal derived from a source extraneous to the label, all of the stages of the registers are reset.

3,571,572
RADIATION BALANCE HORIZON SENSOR WITH AN EARTH TANGENCY MASK

Gerald Falbel, Stamford, Conn., assignor to Barnes Engineering Company, Stamford, Conn.

Continuation-in-part of application Ser. No. 566,163, July 18, 1966, now abandoned. This application June 2, 1969, Ser. No. 829,219
Int. Cl. G01p 13/00
U.S. Cl. 250—83.3 3 Claims

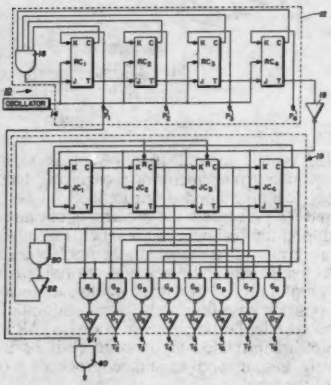


A horizon sensor of the radiation balance type is described with an earth tangency mask so that the horizon sensor detectors are illuminated only by a narrow band of radiation at the horizon of the earth's disc when the horizon sensor is positioned for correct vehicle attitude.

3,571,573
CLOCKING SYSTEM

Granville E. Ott, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 30, 1966, Ser. No. 606,066
Int. Cl. G06m 3/02; H03k 21/08
U.S. Cl. 235—92 2 Claims

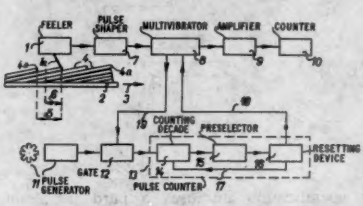


A ring counter having a one count delay during each cycle is used to clock a Johnson counter during the one count delay. A number of individually identifiable clock pulses are then available for clocking and sequential control functions by ANDing any one of the outputs of the ring counter with any one of the outputs of the Johnson counter, the total number being equal to the product of the number of ring counter outputs and the number of Johnson counter outputs.

3,571,574
COUNTING DEVICE FOR FOLDED SHEETS, PARTICULARLY FOLDED NEWSPAPERS

Walter Gerber, Uster, Zurich, Switzerland, assignor to Ferag, Fehr & Reist AG., Zurich, Switzerland

Filed June 13, 1967, Ser. No. 645,758
Claims priority, application Switzerland, June 15, 1966, 8606
Int. Cl. G06m 7/06
U.S. Cl. 235—92 4 Claims

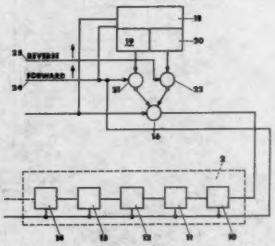


The counting device according to the invention is particularly adapted to count newspapers travelling in imbricated arrangement on a conveyor means past a feeler which upon being actuated by each successive protruding folding edge of the overlapping newspapers produces an electrical pulse to be registered by a counter. Means are provided for blocking the registering operation of the counter during a period of time corresponding to the time of passage of a fraction of the distance between two successive folding edges past said feeler.

3,571,575
MEASUREMENT DEVICES

John Denzil Barr, Oadby, Leicester, and Peter Frederic Thomas Cryer Stillwell, Aldershot, England, assignors to The Rank Organisation Limited, London, England

Filed June 28, 1967, Ser. No. 649,603
Int. Cl. G06m 1/272, 3/14
U.S. Cl. 235—92 3 Claims

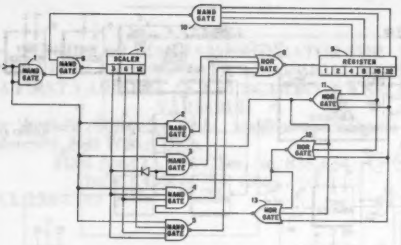


An electronic counter is provided for use in counting pulses, for example pulses representing interference fringes in laser interferometers. In order to give an output reading in a predetermined scale of measurement, for example, the metric system the pulses are counted in a first counter and pass through a gate to a second counter which gives the output reading, the gate being controlled in dependence upon the first counter so that the gate is blocked, for the duration of one input pulse, at predetermined intervals, such that the count in the second counter is modified by a predetermined ratio to give an output count in the desired scale of measurement.

3,571,576
COMPRESSION OF STATISTICAL DATA FOR COMPUTER TAPE STORAGE

Marion M. Satterfield, Oak Ridge, Tenn., assignor to the United States of America as represented by the United States Atomic Energy Commission

Filed Oct. 10, 1968, Ser. No. 766,434
Int. Cl. Ho3k 21/02
U.S. Cl. 235—92 5 Claims

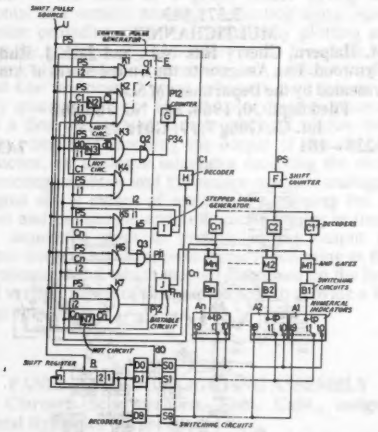


Circuitry has been provided which compresses statistical data with an error less than one standard deviation to permit recording approximately 500 counts in six levels of one character of a storage tape. Counts are fed into a six-place digital accumulator, the first eight individually, then by threes until the accumulator reaches 16, then by sixes until the accumulator reaches 32, and then by twelves until the six places are full. The information stored in the accumulator can then be read onto conventional magnetic or paper storage tape.

3,571,577
NUMERICAL DISPLAY SYSTEM

Kikuo Kubo, and Takafumi Kumagai, Tokyo, Japan, assignors to Nippon Columbia Company, Limited, Tokyo, Japan

Filed Jan. 17, 1968, Ser. No. 698,450
Claims priority, application Japan, Jan. 25, 1967, 42/5167
Int. Cl. G09f 9/00
U.S. Cl. 235—92 5 Claims

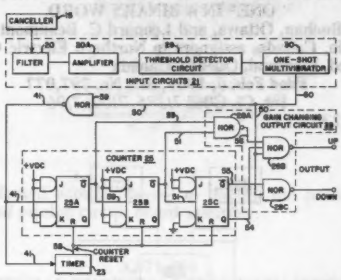


A numerical display system characterized in that a plurality of numerical indicators are sequentially and serially driven from the least significant one to the most significant one in synchronism with the sequential period of a register including a plurality of digit portions in which numerical contents to be displayed are stored and digit sequentially taken out therefrom by way of right shift, and the contents of said register are displayed with invalid zero or zeros prevented from being indicated.

3,571,578
DIGITAL ADAPTIVE CONTROL SYSTEM SENSOR

Laurel D. Fry, Endwell, N.Y., assignor to General Electric Company

Continuation of application Ser. No. 370,227, May 26, 1964, now abandoned. This application Mar. 20, 1969, Ser. No. 814,502
Int. Cl. G05b 13/02
U.S. Cl. 235—150.1 7 Claims

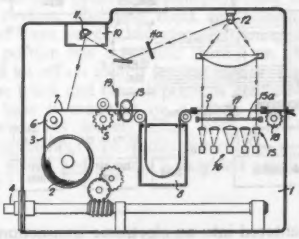


A damping sensor that counts the number of signal half cycles of an adaptive mode signal between the occurrence of a transient signal exceeding a selected threshold level and the time at which system damping reduces the adaptive signal amplitude below the threshold level, times the signal half cycles, and generates gain changing signals in accordance with the count. The sensor counts signal threshold crossings during each of repetitive adaptive sensing program cycles. The program cycles are initiated by a transient signal exceeding a threshold established by a deadband circuit and terminated by a timer after a fixed time from the last signal half cycle exceeding the threshold or after the first zero crossing if the second zero crossing comes after the fixed time setting of the timer in those instances in which the adaptive mode signal frequency is too low.

3,571,579
ASSESSING OF SURFACE PROFILES

David John Whitehouse, Melton Mowbray; John Denzil Barr, Oadby; Richard Edmund Reason, Market Harborough; Thomas Charles Reeve, London; Robert Claude Spragg, Leicester; Arthur Tisso Starr, New Barnet, and Peter Frederic Thomas Cryer Stillwell, Aldershot, England, assignors to The Rank Organisation Limited, London, England

Continuation-in-part of application Ser. No. 521,286, Jan. 18, 1966, now abandoned. This application Apr. 25, 1968, Ser. No. 723,978
Int. Cl. G01b 7/34; G06g 7/19
U.S. Cl. 235—151.3 31 Claims



This invention relates to an instrument for testing the surface profile of a workpiece for irregularities. A conventional stylus arrangement is used to derive signals representative of the irregularities of the workpiece profile relative to a convenient datum, and these signals are stored, for example on a film strip or a magnetic tape. Signals are then extracted from the store by operating on each successive value of the stored

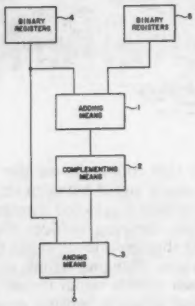
signal with a weighting function which is nominally symmetrical about an instantaneous midordinate. The resulting signal represents, for each successive part of the profile under test, the convolution of the respective part of the first signal with the said weighting function, and is arranged to represent a useful means line from which the surface irregularities indicated by the first signal may be assessed.

3,571,580

DEVICE FOR DETERMINING LEAST SIGNIFICANT "ONE" IN A BINARY WORD

John S. Buchan, Ottawa, and Leonard C. Beaumont, Kanata, Ontario, Canada, assignors to Northern Electric Company Limited, Montreal, Quebec, Canada

Filed Feb. 6, 1969, Ser. No. 797,077
Int. Cl. G06f *7/385, 7/00, 7/06*
U.S. Cl. 235—152 **4 Claims**



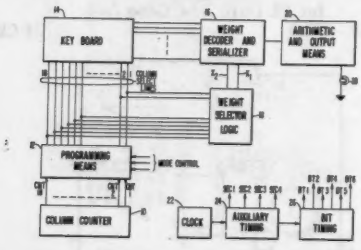
The position of the least or most significant ONE-bit in a binary word is determined by adding the binary word to another binary word of the same length but consisting of all ONE-bits. The carry bits which are generated in the addition are complemented and ANDED with the original word to result in a binary word consisting of all ZERO-bits except for a ONE-bit at the position of the least significant bit in the original binary word.

3,571,581

DIGIT VERIFICATION SYSTEM FOR AN ELECTRONIC TRANSACTION RECORDER

Roger D. Kaus, and John A. Muehlenbein, Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 10, 1968, Ser. No. 758,873
Int. Cl. G06f *11/08*
U.S. Cl. 235—153 **17 Claims**



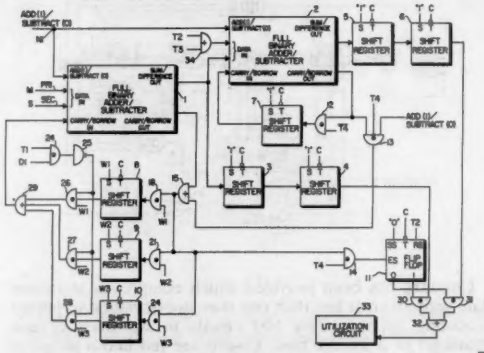
A number entered into an electronic transaction recorder is verified for accuracy in accordance with a mathematical prescription or predetermined mathematical rules. The numbers entered are assumed to be preassigned numbers which conform to a prescribed and predetermined rule of composition. If a number was incorrectly entered, an indication is provided that an error was made in the entry. By including a programming means within the verification apparatus, the system is flexible with regard to the length of the numbers to be checked and the keyboard position of the numbers to be checked.

3,571,582

SERIAL BCD ADDER/SUBTRACTER UTILIZING INTERLACED DATA

Leroy U. C. Kelling, Waynesboro, Va., assignor to General Electric Company

Filed Feb. 29, 1968, Ser. No. 709,404
Int. Cl. G06f *7/50*
U.S. Cl. 235—170 **13 Claims**



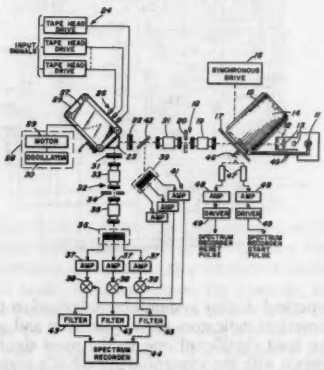
A serial digital adding/subtracting arrangement for binary coded decimal data presented in interlaced format. The input data comprises a series of multidigit decimal words interlaced by serially presenting the least significant digit of each word in predetermined sequence, followed by the next digit of each word similarly interlaced, and so on throughout the data. The adding/subtracting utilizes two full adder/subtracters, the first for adding or subtracting the input data, the second for adding or subtracting six to or from the sum or difference generated by the first. The presence of a carry from either adder during the fourth bit time indicates the need for a radix correction from binary to decimal in which case the output of the second adder is selected. Several shift registers, one associated with each word, are provided to store the interdigital carries associated with that word during the processing of other words through the system.

3,571,583

MULTICHANNEL

Henry M. Halpern, Cherry Hill, N.J., and Jack J. Rudnick, Bala Cynwood, Pa., Assignor to the United States of America as represented by the Department of Navy

Filed Sept. 30, 1968, Ser. No. 763,862
Int. Cl. G06g *7/19;* **G01r** *23/18*
U.S. Cl. 235—181 **7 Claims**



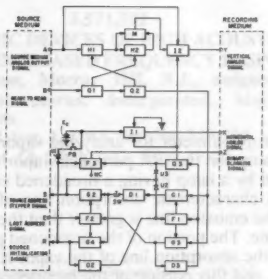
This invention is directed to a multichannel optical cross-correlation analyzer. The analyzer utilizes two function on recording media whose directions of motion are perpendicu-

lar to each other. One of the functions is recorded on a Kerr magneto-optic surface. A beam of light is first modulated by one of the functions and then is modulated by the other of the functions. The modulated beam is then integrated by a photodiode array and the electrical output of the diodes recorded. The analyzer implements the integral;

3,571,584
FUNICULAR DIAGRAM GENERATOR FOR GENERATING AN AUTOMATIC GRAPHICAL DISPLAY OF A FIRST VARIABLE AS A FUNCTION OF A SECOND VARIABLE

Victor W. Bolie, Stillwater, Okla., assignor to Okahoma State University, Still Water, Okla.

Filed June 23, 1969, Ser. No. 835,634
Int. Cl. G06g 7/26; G06j 1/00
U.S. Cl. 235—197 **4 Claims**



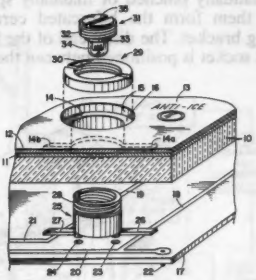
This invention provides a funicular diagram generator. More particularly, the invention relates to a funicular diagram generator for use as an interface between a source medium having the form of a stepwise addressable sequential channel output of analogue signal samples and a recording medium in the form of a graph tracer having separate horizontal and vertical analogue deflection signal inputs, the generator providing means of graphically plotting and displaying the analogue signal samples in the form of a continuous funicular diagram consisting of adjacent connected straight-line segments joining adjacent data points having equally spaced abscissas. The funicular diagram generator includes a first and second sample-and-hold circuit means, a summing amplifier receiving the output of the sample-and-hold means, an analogue integrator receiving the output of the summing amplifier and the source medium analogue output signal and a means of sequentially stepping the source medium and the sample-and-hold circuit means in time relationed sequential steps to provide at the output of the analogue integrator a composite signal functioning as the vertical analogue signal which may be impressed on the horizontal and vertical inputs of the graph tracer to provide a funicular diagram display.

3,571,585
PANEL AND EDGE LIGHTING ASSEMBLY

Louis Clarence Schermerhorn, Simi, Calif., assignor to Coastal Dynamics Corporation

Filed Nov. 12, 1968, Ser. No. 774,938
Int. Cl. B60q 3/04
U.S. Cl. 240—8.16 **3 Claims**

An edge lighted panel for use principally in illuminating nomenclature associated with aircraft instruments is provided with front mounted lamps in substantially flush relationship with the front surface of the panel and yet so designed that they may be removed and replaced from the front surface. Electrical energy is provided for the lamps by means of a printed circuit board affixed to the rear of the panel and having conductive paths connecting to leads associated with a filter housing for the lamp received in a bore in the panel itself. The arrangement is such that replacement of the lamps



can be effected without having to disturb the panel, filter housing and printed circuit board assembly.

3,571,586
AN ARTIFICIAL CHRISTMAS TREE WITH INTEGRAL LIGHTING MEANS

Hugh L. Duckworth, 3305 W. Palner St., Chicago, Ill.

Filed Apr. 29, 1969, Ser. No. 820,115
Int. Cl. A47g 33/16
U.S. Cl. 240—10 **4 Claims**

An artificial tree in the nature of a Christmas tree having a base portion from which projects a trunk portion and a plurality of individual branch portions projecting at angles from the trunk portion. The base, trunk and branch portions are hollow and have an electric circuit running therethrough. The base portion has contained therein an electric power source and an off-on switch for the circuit. Lights are provided in the trunk and branch portions connected to the circuit. The base is mounted on a fabric or flexible plastic member which is loosely filled with granular material whereby the member will readily conform to any surface on which it is placed and provide a weighted nonsliding bottom for the tree.

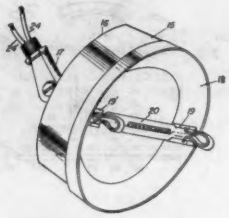
3,571,587
LIGHTING FIXTURE USING DOUBLE-ENDED QUARTZ LAMPS

Hy Hilzen, Yonkers, N.Y. (29 Grant St., P.O. Box 285 Walden, N.Y. 12586)

Filed Aug. 2, 1968, Ser. No. 749,872
Int. Cl. F21m 7/00
U.S. Cl. 240—11.4 **2 Claims**

An electrical lighting fixture having an easily mountable and removable bail at each mounting bracket for supporting

and connecting the lamp of the lighting fixture. The bail serves to intercept the lamp should it become detached at either or both ends and hold it from falling. The bails are either manually pinched or manually spread to mount and remove them form the bifurcated ceramic body of each mounting bracket. The distal end of the lamp having a metal terminal socket is positioned between the tines of the mounting bracket and receives a spring-biased pin providing support and electrical connection for the lamp. In a modification, the bails extend from the floor of a pan made of a material through which light can pass and serves to catch fragments of the lamp should it become shattered and also serves to diffuse the light. The pan and its associated bails are in releasable engagement.

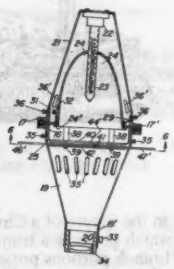


3,571,588

ELECTRICAL SPOTLIGHT CONSTRUCTION AFFORDING ECONOMICAL ASSEMBLY AND EASY MANIPULATION

Hy Hilzen, Yonkers, N.Y. (29 Grant St. P.O. ox 285 Walden, NY 12586)

Filed Sept. 6, 1968, Ser. No. 757,906
Int. Cl. F21v *29/00*
U.S. Cl. 240—47 **5 Claims**



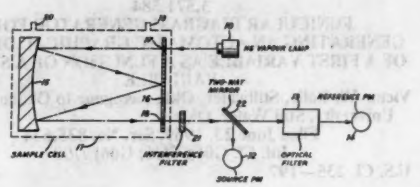
The spotlight comprises a central ring structure swingably mounted within a fixed bail, and carrying a releasable rear casing part which is a shell holding the lamp socket, and a releasable front tubular casing part holding an adjustably positioned lens. The ring structure comprises two concentric rings connected by a web having openings. The casing parts are on opposite ends of the outer ring. A shell serving as a reflector, extends into the rear casing part, and has an outward flange around its mouth which bears against the forward end of the inner ring. The reflector is through the inner ring. Setscrews through tabs on the inner ring, engage the reflector. A straight lamp extends from its socket mounted in the rear casing part, and through an apex hole in the reflector. The ring structure is spanned by an adjustable light beam framing structure.

3,571,589

METHOD FOR ABSORPTION ANALYSIS USING A SOURCE HAVING A BROADENED EMISSION LINE

Anthony Rene Barringer, Willowdale, Ontario, Canada, assignor to Barringer Research Limited, Rexdale, Ontario, Canada

Continuation of application Ser. No. 494,680, Oct. 11, 1965, now Patent No. 3,449,565, dated June 10, 1969. This application June 4, 1969, Ser. No. 830,406
Int. Cl. G01n *23/12*
U.S. Cl. 250—43.5 **4 Claims**



A spectrophotometer for analyzing vapors having characteristic absorption lines. A particular vapor to be analyzed is illuminated by a lamp having a broadened emission line centered at a characteristic absorption line of the vapor. The width of the emission line is greater than the width of the absorption line. The portion of the broadened emission line that is outside the absorption line of the vapor is not absorbed by the vapor, and this portion of the broadened emission line is used as a reference against which to compare absorption of light of wavelengths within the absorption line width.

3,571,590

ELECTRON MICROSCOPE HAVING A COMPENSATION DEVICE FOR COMPENSATING THE DEVIATION OF A DIFFRACTION IMAGE

Shinjiro Katagiri, and Mamoru Nakano, Katsuta-shi, Japan, assignors to Hitachi, Ltd., Tokyo-To, Japan

Filed May 27, 1968, Ser. No. 732,249
Int. Cl. H01j *37/26*
U.S. Cl. 250—49.5 **9 Claims**

An electron microscope wherein deflecting coils disposed between an objective lens and an intermediate lens are provided to compensate for the deviation of the diffraction image of a specimen by adjusting the deflecting magnetic field which is produced by the deflecting coils to which exciting currents proportional to an exciting current of the intermediate lens are applied.

3,571,591

METHOD FOR DETERMINING THE ORIGIN OF HYDROCARBON SEEPS IN WATER-COVERED AREAS AS AN AIR TO PETROLEUM EXPLORATION ACTIVITIES

John S. Bradley, Tulsa, Okla.; William H. Luehrmann, and Glenn D. Roe, Dallas, Tex., assignors to The Atlantic Richfield Company, Philadelphia, Pa.

Filed Feb. 11, 1966, Ser. No. 526,808
Int. Cl. G01n *32/00, 1/00*
U.S. Cl. 250—83 6 Claims

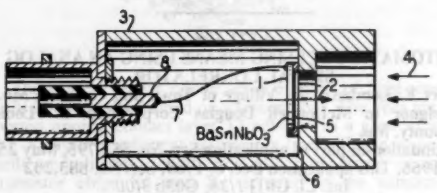
A method for determining the origin of hydrocarbon seeps in water-covered areas in order to establish whether the seeps are derived from depth and thereby indicative of subsurface deposits of petroleum or whether they merely represent marsh gas. The seep gases are sampled directly and also by degassing water samples taken from sediments in the immediate vicinity of the seeps. Alpha-activity measurements are made on the seep gases and their origin is determined by comparison with alpha-activity ratios obtained using known standards.

3,571,592

PYROELECTRIC DEVICES OF HIGH ACOUSTIC LOSS SHOWING INCREASED FREQUENCY RESPONSE

Alastair M. Glass, Murray Hill, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights

Filed Aug. 1, 1968, Ser. No. 749,354
Int. Cl. G01k *7/02*; H01j *39/00*
U.S. Cl. 250—83 5 Claims



A class of materials exemplified by mixed crystals of barium niobate and strontium niobate acts as a radiation detector by reason of the change in polarization resulting from the heating produced by an incident beam. This pyroelectric response is sufficiently rapid for infrared radiation that a pulse train well in excess of a megabit per second may be followed for incident beam power well below 1 watt.

ERRATUM

For Class 250—83.3 see:
Patent No. 3,571,572

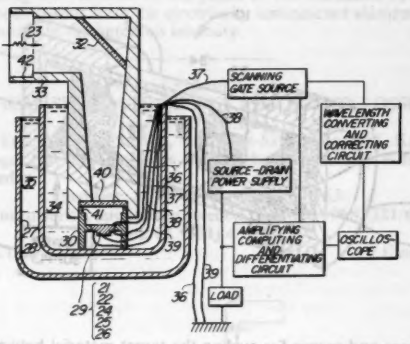
3,571,593

INFRARED AND FAR INFRARED DETECTOR OR AMPLIFIER USING MOS STRUCTURE ELEMENT

Kiichi Komatsubara, Kodaira-shi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 18, 1969, Ser. No. 800,068
Claims priority, application Japan, Feb. 19, 1968, Sept. 6, 1968, 43/10070;43/63732
Int. Cl. G01j *5/20*
U.S. Cl. 250—83.3 10 Claims

A device using a MOS structure element, in which the element is cooled to such a low temperature that substantially all of the carriers in the inversion layer populate in the ground level of the quantized energy levels formed in that layer in order that the energization of the electric field or the radiation causes the resonance transition, and in which an infrared or far infrared radiation beam directed to that layer is spectrally detected or amplified by the variation in the channel current or the stimulated emission both of which are caused by the change in the carrier population due to the resonance transition.

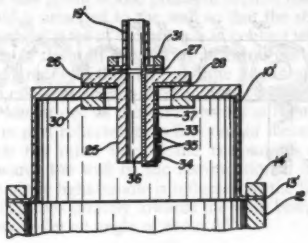


3,571,594

ELECTRONIC TUBE CONTAINING ACTIVE METAL

Lowell A. Nobel, Hillsborough, Calif., assignor to Varian Associates

Filed June 21, 1960, Ser. No. 37,803
Int. Cl. G21g *3/04*; H01j *9/38*
U.S. Cl. 250—84.5 8 Claims



A neutron source tube comprising an evacuated envelope, a target of active metal in the tube, a hydrogen isotope sorbed in said target, a second member of active metal in said tube, a hydrogen isotope sorbed in said second member of active metal, spaced terminals on the outside of said envelope electrically connected respectively to said target and said second member of active metal whereby said target and said member become electrodes, a third electrode in said tube for establishing an arc between itself and said second member of active metal, a coating on said target preventing desorption of the hydrogen isotope in the target and being penetrable by hydrogen isotope ions, and a coating on said second member of active metal preventing desorption of the hydrogen isotope in the target and being destructible by said arc.

3,571,595

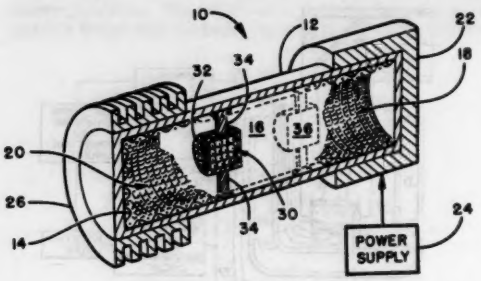
VARIABLE RATE NEUTRON SOURCE

Gary L. Silver, Centerville, Ohio, assignor to the United States of America as represented by the United States Atomic Energy Commission

Filed Apr. 15, 1969, Ser. No. 816,237
Int. Cl. G21g *3/04*
U.S. Cl. 250—84.5 6 Claims

The present application comprises a variable rate neutron

source including an alpha radiation source, a neutron emitting target material normally separated from said alpha source and means for cycling the target material between its separated location and contact with the alpha source.



3,571,596

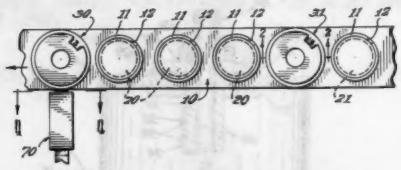
PROGRAMMING APPARATUS FOR AN AUTOMATIC LIQUID SCINTILLATION COUNTING SYSTEM

Richard B. Frank, Deerfield, and George J. Hanz, Bloomingdale, Ill., assignors to Nuclear-Chicago Corporation, Des Plaines, Ill.

Filed Jan. 8, 1969, Ser. No. 789,907

Int. Cl. G21h *5/00;* **G01n** *21/30;* **G06m** *7/00*

U.S. Cl. 250—106 **5 Claims**



Sample group programming apparatus comprising a program indicating plug mounted on a sample conveyor and reading apparatus adjacent the conveyor. The program indicating plug includes a support member carrying a vertically disposed optical structure, and a code cylinder rotatably mounted thereon. Five circumferential rows of apertures exist on the code cylinder, one for admitting light to the optical structure and four for providing 16 separate binary coded vertical arrays. The reading apparatus comprises a light source and four light responsive elements appropriately mounted on a support structure adjacent the conveyor to read the operative array of apertures on a plug in a reading position.

3,571,597

SYSTEM FOR PHASE STABILIZING WIDELY SEPARATED OSCILLATORS

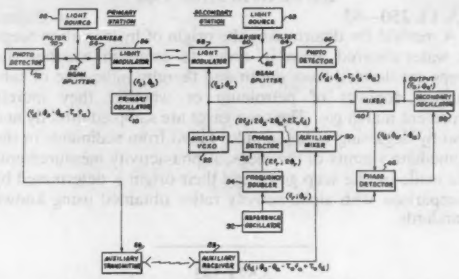
Lockett E. Wood; Moody C. Thompson, Jr, Boulder; William B. Grant, Longmont, and Dean Smith, Boulder, Colo., assignors to the United States of America as represented by the Secretary of Commerce

Filed Oct. 14, 1969, Ser. No. 866,181

Int. Cl. H04b *9/00, 1/00*

U.S. Cl. 250—199 **5 Claims**

A primary station and a remote secondary station generate a primary signal and an auxiliary signal, respectively, at slightly different frequencies. The primary signal is transmitted to the secondary station and mixed with the auxiliary signal, to give a first IF signal. The auxiliary signal is transmitted to the primary station and mixed with the primary signal to obtain a second IF signal, which is returned to the secondary station via an auxiliary FM link. The two IF signals are then mixed to give a signal at twice the IF frequency. A locally generated reference signal of frequency equal to the IF frequency is doubled and compared with the signal from the last mixer, to give an error signal that is applied to the voltage-tuned auxiliary signal oscillator. This established a closed feedback loop that maintains the phase of the auxiliary signal equal to the phase of the primary signal and the phase delay of the path between the stations. A secondary oscillator at the frequency of the primary signal is then phase locked to the auxiliary signal to provide a signal that is coherent with the primary signal. The primary and auxiliary signals may be transmitted as modulations on light beams directed over the path between the stations.



3,571,598

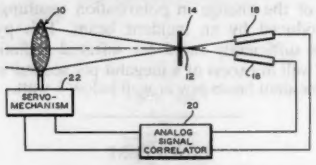
AUTOMATIC FOCUSING MEANS USING AN ANALOG SIGNAL CORRELATOR

Albert E. Lombard, Jr, Village of Town and Country, Mo., assignor to McDonnell Douglas Corporation, St. Louis County, Mo.

Continuation-in-part of application Ser. No. 552,795, May 25, 1966. This application Dec. 8, 1969, Ser. No. 883,202

Int. Cl. G01j *1/36;* **G03b** *3/00*

U.S. Cl. 250—204 **6 Claims**



Apparatus for automatically focusing an optical device including means responsive to selected rays of an optical image being viewed, said means producing output responses representative of the selected rays being observed including variations therein, means for correlating the output signals to produce a correlation output, and means for focusing the optical device including means responsive to the correlation output.

3,571,599

PHOTOMULTIPLIER TUBE CIRCUIT EMPLOYING VARISTOR

Reginald W. Neale, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

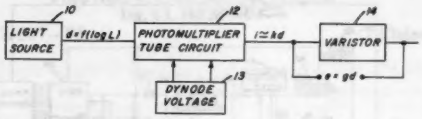
Filed Feb. 24, 1969, Ser. No. 801,393

Int. Cl. H01j *39/12*

U.S. Cl. 250—207 **8 Claims**

The output of a photomultiplier tube circuit is disclosed as being developed across a varistor, thereby to linearize such

output as a function of a logarithmically variable input to the



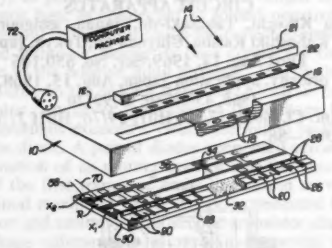
photomultiplier tube.

3,571,600

OPTICAL READER UNIT INCLUDING MULTIPLE LIGHT-SENSITIVE CELLS EACH WITH CONTIGUOUS AMPLIFIERS

Irwin Rubin, Van Nuys, Calif., assignor to Sensor Technology, Inc., Van Nuys, Calif.

Filed July 28, 1967, Ser. No. 656,830
Int. Cl. H01j *39/12*
U.S. Cl. 250—208 9 Claims



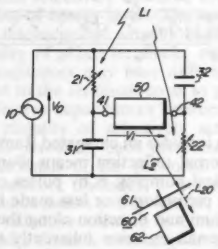
The optical reader comprises a number of light-sensitive cells 20 integrally formed on a silicon base. The cells are supported upon a contact layer 32 adhered to a glass substrate 30. Arrayed in adjacent columns in line with the respective cells are individual amplifier circuits. Each circuit comprises transistor chips X1 and X2 adhered to the substrate, a printed resistor chip R and suitable interconnecting conductors. The substrate and components carried thereby are fitted in a reader head or holder 10 incorporating suitable collimating and image-forming apparatus. The signals from the reader have sufficient strength for direct coupling to logic circuits.

3,571,601

PHASE-SHIFTING BRIDGE HAVING PHOTOCELLS AND ELECTROLUMINESCENT ELEMENTS

Tadao Kohashi, Yokohama, Japan, assignor to Matsushita Electric Industrial Co. Ltd., Osaka, Japan

Filed Oct. 8, 1968, Ser. No. 765,891
Claims priority, application Japan, Oct. 13, 1967, Nov. 7, 1967, 42/66764;42/72331
Int. Cl. H01j *39/12*
U.S. Cl. 250—210 4 Claims



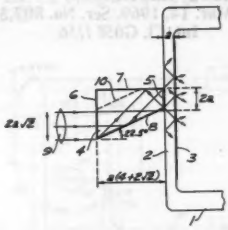
An energy-sensitive luminescent device having means including an energy-sensitive element whose impedance is variable depending on an energy signal applied thereto so that a variation in the impedance thereof can be utilized for shifting the phase of an AC voltage applied from an AC voltage supply to an electrically luminescent element, and means for detecting the variation in the phase of the waveform of the luminous output from the electrically luminescent element as a variation in the luminous intensity.

3,571,602

OPTICAL SYSTEM TO REDUCE REFLECTION LOSSES IN A PHOTOCELL

Axel Erik Ludvig Ohlsson, and Lars-Erik Skagerlud, Karlskoga, Sweden, assignors to Aktiebolaget Bofors, Bofors, Sweden

Filed Dec. 30, 1968, Ser. No. 787,953
Claims priority, application Sweden, Jan. 10, 1968, 321/68
Int. Cl. H01j *43/28*
U.S. Cl. 250—216 7 Claims



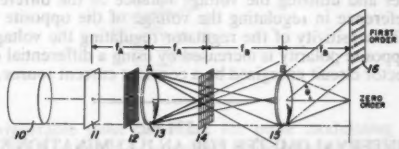
A photodetector system including a photocell of the type having a photosensitive coating on the internal surface of a plane transparent wall forming part of the envelope of the cell. At least one prism whose principal section has the form of a trapezoid is attached to the wall so that the shorter one of the two parallel sides of the prism is in contact with the exterior surface of the wall in front of a central portion of the coating. The lengths of the sides and the angles of the principal section of the prism are so chosen that a bundle of light entering the longer one of the parallel sides at right angles to that side, is in part reflected by a first one of the nonparallel sides towards the other one of the nonparallel sides and reflected towards the wall by the last-mentioned side, while another part of the light bundle is reflected by the first one of the nonparallel sides directly towards the wall, both parts entering the wall under an angle of about 45°

3,571,603

OPTICAL READER AND CHARACTER IDENTIFICATION SYSTEM UTILIZING A TWO-DIMENSIONAL DIFFRACTING MEANS

John F. Bryant, Lemon Grove, and Will T. Hyde, Jr., Chula Vista, Calif., assignors to the United States of America as represented by the Secretary of the Navy

Filed Nov. 12, 1968, Ser. No. 774,737
Int. Cl. G01n *21/30*; G06k *9/00*, *9/08*
U.S. Cl. 250—219 6 Claims



A source of collimated coherent light is arranged to impinge upon a character to be identified and a two-dimensional diffraction means is positioned in the path of the collimated light passing through the character to be identified, forming a plurality of spatially disposed diffraction patterns. Appropriate optical means of a determinable focal length is

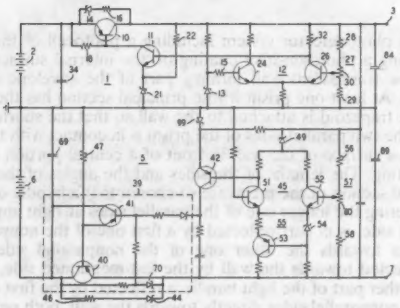
positioned one focal length from the position of the character to be identified, forming far-field images of the plurality diffraction patterns. A filter has a plurality of spaced discrete areas each defining the distinctive diffraction pattern of a known character by holographic techniques. Optical means integrates the light passing through the filter, diverting it to a first order, off-beam position. A plurality of light-responsive means, disposed in the first order off-beam position, and each related to a discrete area of the optical filter produces a signal in response to a predetermined amplitude of light passing through the filter, therefore identifying the character which was initially exposed to the source of collimated coherent light.

3,571,604

DUAL POLARITY VOLTAGE REGULATOR WITH TRACKING OUTPUTS

Brank C. La Porta, Livingston, and Paul W. Ussery, Middletown, N.J., assignors to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed Mar. 14, 1969, Ser. No. 807,332
Int. Cl. G05f *1/56*
U.S. Cl. 307—24 **4 Claims**



A dual output voltage regulator supplying regulated voltages of identical magnitude and opposite polarity regulates the voltage of one polarity by comparison to a fixed reference voltage. The regulated voltage of the opposite polarity is regulated by detecting the voltage difference between the two regulated output voltages of opposite polarities and utilizing the voltage balance of the difference as a reference in regulating the voltage of the opposite polarity. The sensitivity of the regulator regulating the voltage of the opposite polarity is increased by using a differential error detector circuit energized by a constant current source.

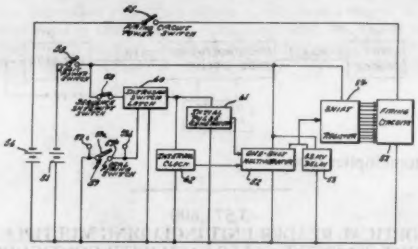
3,571,605

INTERVALOMETER FOR AN ILLUMINATION SYSTEM

James J. Dobson; Michael J. Capparelli, Jr.; John R. Miller, Rome, and Dennis H. Majkowski, Griffiss AFB, N.Y., assignors to the United States of America as represented by the Secretary of the Air Force

Filed Aug. 25, 1969, Ser. No. 852,815
Int. Cl. H02j *3/06*
U.S. Cl. 307—41 **3 Claims**

An electrical intervalometer for a battlefield illumination system wherein an electronic impulse fires a flare and also controls the time interval for the firing of subsequent flares with the further ability of interrupting the firing sequence



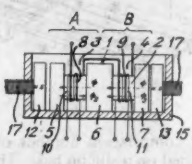
and then resuming firing at the aforementioned time intervals.

3,571,606

SATURABLE REACTOR TYPE COMPENSATING CIRCUIT APPARATUS

Masakazu Kikuchi, Takasaki-shi, Japan, assignor to Taiyo Yuden Kabushiki Kaisha, Chiyoda-ku, Tokyo, Japan

Filed Aug. 14, 1969, Ser. No. 850,105
Claims priority, application Japan, Aug. 15, 1968, Oct. 17, 1968, 43/69780; 43/90120
Int. Cl. H03k *17/80;* **H01j** *29/70;* **H01f** *21/08*
U.S. Cl. 307—88 **7 Claims**



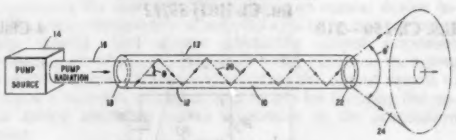
Saturable reactor apparatus in which primary and secondary windings, respectively coupled to horizontal and vertical deflection current sources, are wound on the shaft of a ferrite core at the opposite ends of which are permanent magnets. Flux generated in the core is controlled either by adjustment of the permanent magnets or by the use of a further permanent magnet.

3,571,607

HIGHLY EFFICIENT RAMAN EMISSION DEVICE

Joseph A. Giordmaine, and Stanley L. Shapiro, Summit, N.J., assignors to Bell Telephone Laboratories Incorporated, Murray Hill, Berkley Heights, N.J.

Filed Nov. 5, 1968, Ser. No. 773,446
Int. Cl. H03f *7/00*
U.S. Cl. 307—88.3 **6 Claims**

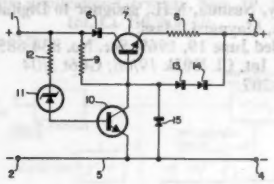


The invention includes an elongated Raman active medium having total internal reflection means along its longitudinal dimension. Optical pumping is by pulses of duration of the order of several picoseconds or less made incident upon one end of the medium and direction along the longitudinal axis thereof. The Raman emission inherently traverses a zigzag path within the medium at an angle such that the group velocity of the Raman and pump pulses is matched, i.e., differences in group velocity of the pump and Raman radiation due to the dispersion of the medium are compensated for.

3,571,608
PROTECTIVE CIRCUIT

Edward T. E. III Hurd, Cinnaminson, N.J., assignor to Honeywell Inc.,, Minneapolis, Minn.

Filed Apr. 4, 1969, Ser. No. 813,550
Int. Cl. H02h *1/04*
U.S. Cl. 307—93 7 Claims

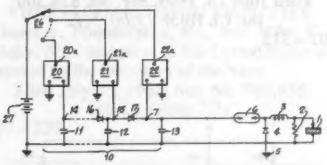


The collector and emitter of a first transistor, which is normally biased on by a collector-base resistor, are connected, respectively, to positive circuit input and output terminals. The transistor base is connected to joined negative circuit input and output terminals through the collector-emitter path of a second transistor having its base connected through a zener diode to the positive input terminal. This diode breaks down and turns on the second transistor, which turns off the first transistor, whenever the value of the voltage between the input terminals exceeds a value determined by the zener rating of the diode. A pair of diodes connected across the series combination of an emitter resistor and the base-emitter junction of the first transistor limits the output current to a predetermined maximum value. A diode connected between the collector and emitter of the second transistor clamps the output voltage substantially to zero in the event that the polarity of the voltage between the input terminals becomes reversed.

3,571,609
IGNITION APPARATUS SELECTIVELY OPERABLE AT DIFFERENT LEVELS OF DISCHARGE ENERGY

Louis I Knudson, Norwich, N.Y., assignor to General Laboratory Associates Incorporated, Norwich, N.Y.

Filed Aug. 20, 1969, Ser. No. 851,699
Int. Cl. H03k *3/00*
U.S. Cl. 307—106 15 Claims



Ignition apparatus selectively operable to produce sparks at any of a plurality of energy levels. The apparatus includes a chargeable and dischargeable network having one common terminal, a plurality of other terminals, and a plurality of capacitors. The capacitors may have different capacitances and are connected to the terminals so as to provide substantially different effective capacitances between different pairs of terminals. A plurality of selectively actuatable energy supply sources are provided, each connected between different pairs of terminals of the networks. The means for discharging the network includes a potential responsive breakdown impedance means and an igniter.

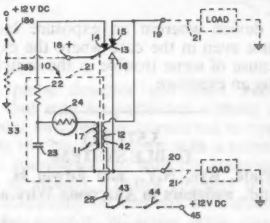
Preferably, an inductive element is connected in series with the igniter and a diode is connected in parallel with the series branch circuit including the inductive element and the igniter. The diode is effective to maintain the discharge from the capacitive network through the igniter as a unidirectional flow, instead of allowing it to oscillate. Since the discharging currents in the capacitors flow only in one direction, the switching of the various capacitors may then be performed by diodes rather than by more complex switching devices. Combinations of capacitors in the network may be selected by selection of one or more of the energy sources, so as to supply the igniter with energy at any plurality of different levels.

In certain modifications all the capacitors in the network are utilized for every energy discharge, the energy level being determined by the selection of the pair of terminals at which the network is charged. Such a network may deliver energy to one or more igniters.

3,571,610
GENERAL PURPOSE FLASHER DEVICE FOR AUTOMOTIVE USE

Rodney Hayden, Stoney Creek, Ontario, Canada, assignor to United-Carr Incorporated, Boston, Mass.

Filed July 10, 1969, Ser. No. 840,689
Int. Cl. B60g *1/46;* H01h *47/00*
U.S. Cl. 307—332 2 Claims

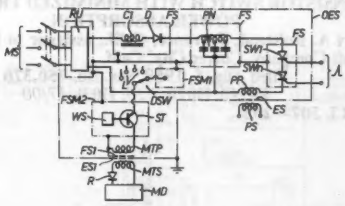


This is an RC coil circuit which can be used as an alternator, a hazard-warning flasher, a turn signal flasher and a buzzer depending on the switch activated.

3,571,611
TRIGGERABLE PULSE GENERATORS

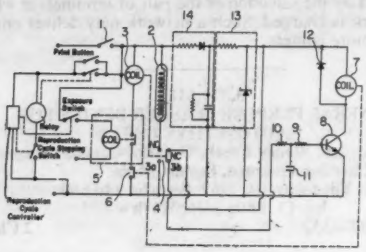
Trevor Howard Robinson, Boreham, Chelmsford; Alan William Cameron, and Philip John Fitz, Great Baddow, Chelmsford, England, assignors to The Marconi Company Limited, London, England

Filed May 7, 1969, Ser. No. 822,402
Claims priority, application Great Britain, May 17, 1968, 23,551/68
Int. Cl. H03k *3/00*
U.S. Cl. 307—108 10 Claims



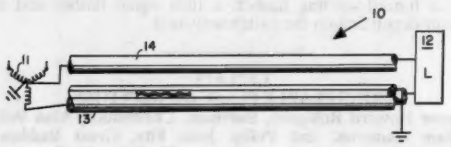
In a triggerable pulse generator for pulse modulating a VHF oscillator or amplifier a low AC voltage is rectified and fed to a charging circuit which feeds, via a pulse-forming circuit, a switching circuit. The switching circuit includes some voltage triggerable electronic switches in series and an output pulse transformer having its primary connected between the switching circuit and a capacitance in the pulse-forming circuit, the secondary being electrostatically screened from the primary. The rectifier unit, charging circuit, pulse-forming circuit and primary are in a circuit which is left "floating" in potential with respect to earth.

3,571,612
SAFETY DEVICE FOR AN EXPOSURE LAMP IN A REPRODUCTION APPARATUS
Takeshi Ukai, Tokyo, and Shoji Sakai, Sagamihara-shi, Japan, assignors to Kabushiki Kaisha Ricoh, Tokyo, Japan
Filed Nov. 27, 1968, Ser. No. 779,446
Claims priority, application Japan, Dec. 20, 1967, 42/81183
Int. Cl. H01h 3/34
U.S. Cl. 307—141.8 7 Claims



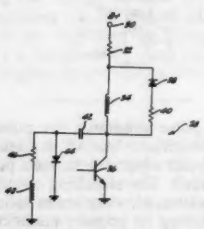
A safety device wherein an exposure lamp is put out without failure even in the case where the exposure lamp is kept on because of some trouble in the switching-off circuit after finishing an exposure.

3,571,613
CABLE SYSTEM
Walter J. Plate, Rye, N.Y., and Edwin H. Arnaudin, Jr., Marion, Ind., assignors to Anaconda Wire and Cable Company
Filed May 20, 1970, Ser. No. 39,674
Int. Cl. H01b 11/02; H02b 5/00; H02j 3/00
U.S. Cl. 307—147 9 Claims



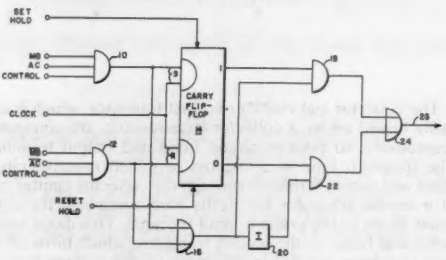
A two-cable underground electrical distribution system for single phase has an insulated power conductor with longitudinal bosses in the jacket into which are embedded no more than four undulatory drain wires, and a separate or duplexed return conductor.

3,571,614
TRANSISTOR SWITCH WITH MINIMIZED TRANSITION POWER ABSORPTION
Albert A. Rolstead, Torrance, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.
Filed Aug. 5, 1968, Ser. No. 750,376
Int. Cl. H02h 7/20; H03k 17/00
U.S. Cl. 307—202 4 Claims



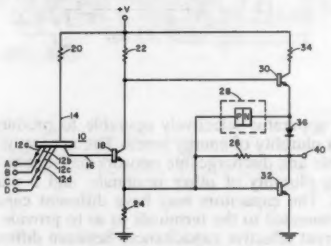
A transistor switch, an inductor and the load are serially connected so that during turn-on transition of the transistor, the inductor holds back current flow until the transistor is saturated. A capacitor paralleled around the transistor charges during turnoff transition so that current through the transistor during transition is minimized to minimize power absorption therein.

3,571,615
LOGIC CIRCUIT
James L. Kelly, Nashua, N.H., assignor to Digital Equipment Corporation, Maynard, Mass.
Filed June 19, 1969, Ser. No. 834,685
Int. Cl. H03k 19/08; G06t 5/04
U.S. Cl. 307—207 10 Claims



A logic circuit module includes a pair of input coincidence gates whose outputs are applied to a carry flip-flop. The outputs of the input coincidence gates are buffered together and applied to separate output coincidence gates together with the outputs of the carry flip-flop. The logic module performs serial binary addition by employing each pair of input bits for gating out as their sum either the bit in the carry flip-flop or its complement. Moreover, by supplying appropriate control inputs to the input gates and the carry flip-flop, the module is capable of executing a plurality of logic functions.

3,571,616
LOGIC CIRCUIT
John R. Andrews, Framingham, Mass., assignor to Honeywell Inc.,, Minneapolis, Minn.
Filed June 18, 1969, Ser. No. 834,360
Int. Cl. H03k 19/00, 5/12
U.S. Cl. 307—215 5 Claims

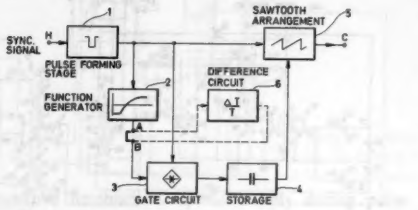


A semiconductor logic circuit adapted for fabrication as a monolithic circuit component. The circuit includes a multiemitter input transistor coupled to a phase splitter transistor which, in turn, connects to a pair of complementary operated output transistors. The circuit further includes slope control circuitry integrally fabricated therein.

3,571,617
EXTERNALLY CONTROLLED SAWTOOTH GENERATOR WITH VARIABLE PULSE DURATION AND CONSTANT AMPLITUDE

Josef Hainz, Ottobrunn, Germany, assignor to Bolkow Gesellschaft mit beschrankter Haftung, Ottoburnn, near Munich, Germany

Filed Nov. 14, 1967, Ser. No. 682,815
Claims priority, application Germany, Nov. 19, 1966, B89909
Int. Cl. H03k *4/50*
U.S. Cl. 307—228 **9 Claims**



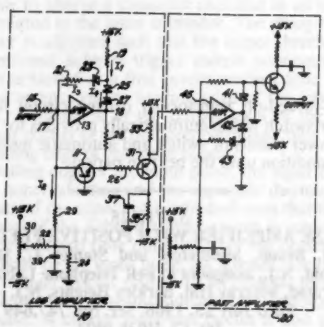
A circuit arrangement for producing a sawtooth voltage, of constant amplitude and a variable slope of the front flank by charging and discharging a condenser. To maintain the amplitude of the sawtooth voltage constant with a varying periodic time of a cycle determined by a synchronizing signal having a certain periodic time, first circuit means produce a voltage corresponding to the respective periodic time of the synchronizing signal, second circuit means store this voltage during a cycle, and additional circuit means control the charging current of the condenser as a function of this voltage. The charging current of each sawtooth voltage cycle or pulse is always controlled by the voltage derived from a preceding cycle or pulse of the synchronizing voltage.

In order to keep the error, appearing with relatively rapid frequency variations with corresponding rapid variations of the periodic time of the synchronizing voltage, in the instantaneous voltage course of the sawtooth signal, negligibly small, additional circuit means add, to a cycle of the synchronizing signal, a differential voltage derived from the aforementioned voltage and the voltage corresponding to a respective preceding cycle. This additional circuit means adds a certain "lead" to the variation of the slope of the sawtooth signal.

3,571,618
VIDEO LOGARITHMIC AMPLIFIER

Henry F. Inacker, Philadelphia, Pa., and Miles C. Johnson, Mount Holly, N.J., assignors to the United States of America as represented by the Secretary of the Navy

Filed July 23, 1968, Ser. No. 746,955
Int. Cl. G06g *7/24*
U.S. Cl. 307—229 **3 Claims**

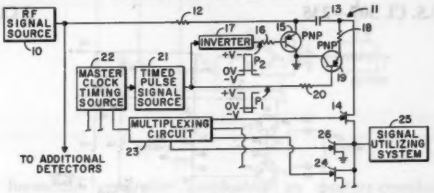


A logarithmic amplifier having a feedback transistor in which the amplifier's input is resistively connected to a DC amplifier and is biased with a power supply resistively connecting the output of the DC amplifier by a pair of diodes and connecting the input by a diode and resistor.

3,571,619
PHASE DETECTOR WITH IMPROVED DYNAMIC RANGE

Norman C. Dickerson, Jr., E. Northpark, N.Y., assignor to Collins Radio Company, Cedar Rapids, Iowa

Filed June 27, 1969, Ser. No. 837,291
Int. Cl. H03k *7/00*
U.S. Cl. 307—232 **16 Claims**

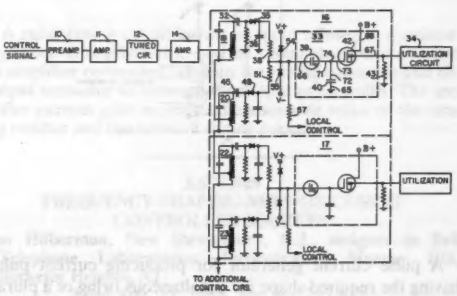


A combined phase detector and filter with improved dynamic range that may be paralleled without cross interference. Transistor switches are connected to opposite sides of a capacitor in the phase detector with a resistor in series with one of the transistors and with the transistor switches also connected to ground. Control circuitry pulse controls the transistors alternately on and off in mutually opposite relation and the resistor in series with one transistor minimizes capacitor discharge during any simultaneous transistor switched on overlap. An electronic gate is provided in the signal output path of each phase detector and an electronic gate is connected between the signal output circuit path and ground for phase detector discharge reset, and with both of these electronic gates time controlled by circuitry also controlling the switch on and off action of the transistor switches.

3,571,620
CHARGING CIRCUIT FOR ESTABLISHING A DC VOLTAGE LEVEL

Robert B. Hansen, Arlington Heights, and Gordon E. Reichard, Franklin Park, Ill., assignors to Motorola Inc., Franklin Park, Ill.

Continuation-in-part of application Ser. No. 644,301, June 7, 1967, now abandoned. This application Oct. 3, 1968, Ser. No. 764,859
Int. Cl. H03k *5/20*
U.S. Cl. 307—233 **17 Claims**



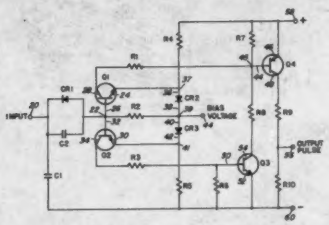
A desired DC voltage level is developed across a capacitor by applying a signal of a particular frequency to the capacitor through a neon tube. The voltage level stored in the capacitor is coupled to other circuitry by a field effect transistor. The capacitor, neon tube and field effect transistor are

packaged in an opaque epoxy to increase the resistance of leakage paths. Clamping circuits are used to limit the range of the voltage stored in the capacitor. The input to the charging circuit is balanced for noise and unbalanced for the signal frequency to provide noise immunity.

3,571,621
SIGNAL SELECTING CIRCUIT

Clifton W. Hart, Diamond Bar, Calif., and Eugene E. Rosacker, Richfield, Minn., assignors to the United States of America as represented by the Secretary of the Air Force

Filed July 25, 1968, Ser. No. 747,713
Int. Cl. H03k *5/20, 5/00*
U.S. Cl. 307—235 **3 Claims**

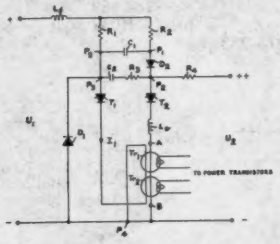


A circuit detects and produces an output whenever a signal of either positive or negative polarity exceeds a predetermined value. The determinative characteristic of the selected (output producing) signal is the amplitude; the duration and shape have little influence upon the production of an output.

3,571,622
CURRENT PULSE GENERATOR FOR SIMULTANEOUS FIRING OF A PLURALITY OF THYRISTORS

Dieter Wallstein, Waldshut, Germany, assignor to Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland

Filed July 25, 1968, Ser. No. 747,573
Claims priority, application Switzerland, Sept. 8, 1967, 12627/67
Int. Cl. H03k *17/00*
U.S. Cl. 307—252 **2 Claims**

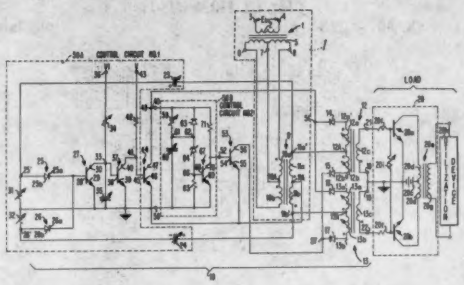


A pulse current generator for producing current pulses having the required shape for simultaneous firing of a plurality of power thyristors comprises two parallel connected branch circuits which are connected to a source of supply voltage, each branch circuit containing an ohmic resistance and a control thyristor arranged in series and the primary windings of the current pulse transformers being arranged in series in one of the branch circuits.

3,571,623
TRANSISTORIZED SWITCHING CIRCUIT AND DRIVER MEANS THEREFOR

Richard D. Church, Candor, and Francis L. O'Malley, Apalachin, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 26, 1967, Ser. No. 693,674
Int. Cl. H03k *17/00*
U.S. Cl. 307—254 **11 Claims**

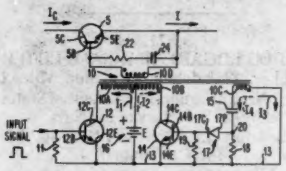


A transistorized switching circuit which employs a driver means that provides turn-on and turnoff driver signals to control input. The driver circuit provides a constant turnoff time period for the turnoff signals. In the preferred embodiment, a transformer-coupled driver circuit having controllable selective means for energizing the transformer windings is disclosed.

3,571,624
POWER TRANSISTOR SWITCH WITH AUTOMATIC SELF-FORCED-OFF DRIVING MEANS

Wing C. Leung, New York, N.Y., assignor to International Business Machines Corporations, Armonk, N.Y.

Filed Sept. 18, 1967, Ser. No. 668,557
Int. Cl. H03k *17/04, 17/80*
U.S. Cl. 307—254 **9 Claims**



A self-forced-off transformer driving circuit for a power transistor switch which automatically provides for fast turnoff of the power transistor switch and automatic maintenance of the off condition until the next on period.

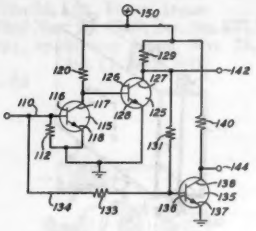
3,571,625
PULSE AMPLIFIER WITH POSITIVE FEEDBACK

Edwin J. Braun, Middleton, and Stanley G. Student, Jr., Freehold, N.J., assignors to Bell Telephone Laboratories Incorporated, Murray Hill, Berkley Heights, N.J.

Filed July 25, 1968, Ser. No. 747,649
Int. Cl. H03k *6/04*
U.S. Cl. 307—263 **8 Claims**

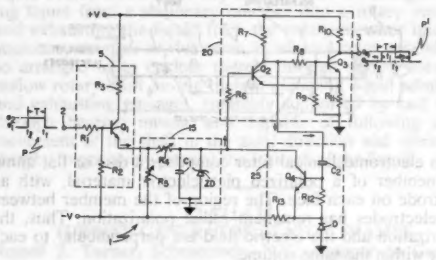
A network connected between the output and the input of a two-transistor pulse amplifier provides regenerative feed-

back which improves the transient response of the amplifier. The feedback network includes a transistor so connected that



the regenerative feedback is operative only during pulse transitions.

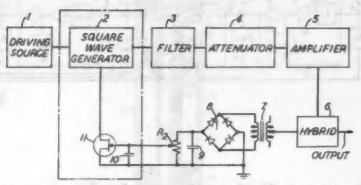
3,571,626
INTEGRATOR-SCHMITT TRIGGER CIRCUIT
Robert H. Reif, Groton, Mass., assignor to Sylvania Electric Products Inc.
Filed Dec. 30, 1968, Ser. No. 787,756
Int. Cl. H03k *5/12, 1/18*
U.S. Cl. 307—263 **9 Claims**



A transistorized integrator-Schmitt trigger circuit for delaying the leading edge of an input pulse for a first predetermined time duration and for delaying the trailing edge of the input pulse for a second predetermined time duration. An input transistor is rendered conducting on the leading edge of an input pulse whereby current flows through the transistor to charge a capacitor included in an integrator circuit connected to the input transistor. The charging rate of the capacitor is adjusted such that the upper threshold level of a conventional Schmitt trigger circuit connected to the capacitor is achieved at a first predetermined time duration after the occurrence of the leading edge of the input pulse. As a result, a transition in the output level of the Schmitt trigger circuit occurs at the first predetermined time duration after the leading edge of the input pulse.

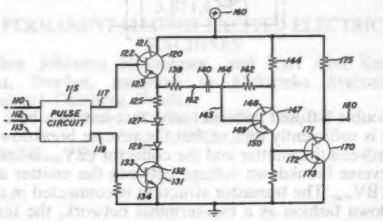
On the trailing edge of the input pulse, the input transistor is rendered nonconducting and the capacitor discharges. The discharge rate of the capacitor is adjusted such that the lower threshold level of the Schmitt trigger circuit is achieved at a second predetermined time duration after the occurrence of the trailing edge of the input pulse. As a result, the output of the Schmitt trigger circuit returns to its original level at the second predetermined time duration after the trailing edge of the input pulse. A charge reduction circuit is also provided for reducing the charge in the capacitor to zero after the output of the Schmitt trigger circuit has returned to its original level thereby increasing the duty cycle of the integrator-Schmitt trigger circuit.

3,571,627
REGULATED HARMONIC GENERATOR
Carlos D. Cardon, Georgetown, and Don S. Williams, Andover, Mass., assignors to Bell Telephone Laboratories Incorporated, Murray Hill, Berkley Heights, N.J.
Filed July 29, 1968, Ser. No. 748,348
Int. Cl. H03k *1/18*
U.S. Cl. 307—271 **5 Claims**



A harmonic generator employing an emitter-coupled monostable multivibrator with a feedback loop including a field effect transistor responsive to variations in the amplitude of a selected harmonic output signal to vary the input bias to the multivibrator. Varying the input bias to an emitter-coupled monostable multivibrator modifies the duty cycle of its rectangular output waveform and thereby regulates the amplitude of the selected harmonic in response to variations in the output signal.

3,571,628
PULSE CIRCUIT
Edwin J Braun, Middletown, and Stanley G. Student, Jr., Freehold, N.J., assignors to Bell Telephone Laboratories Incorporated, Murray Hill, Berkley Heights, N.J.
Filed June 25, 1968, Ser. No. 739,874
Int. Cl. H03k *17/28*
U.S. Cl. 307—293 **12 Claims**

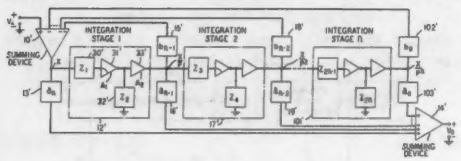


A pulse timing circuit having an input transistor, a resistor-capacitor timing network, and an output transistor employs an amplifier connected between the timing capacitor and the output transistor to increase the output pulse width. The amplifier current gain increases the allowable value of the timing resistor and the network timing period.

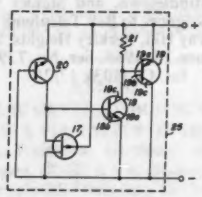
3,571,629
FREQUENCY-SHAPING NETWORK USING CONTROLLED SOURCES
Dan Hilberman, New Shrewsbury, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, NJ
Filed Aug. 12, 1968, Ser. No. 751,829
Int. Cl. H03b *1/04*
U.S. Cl. 307—295 **12 Claims**

A frequency-shaping network is disclosed which combines voltage-controlled voltage sources and current-controlled current sources to provide a voltage integrator. By combining the controlled sources to form an integrator, advantageous

use may be made of this integrator in a frequency-shaping network in order to provide a transfer function which is relatively insensitive to the gain of the amplifiers used in the controlled sources. Further, the transfer function coefficients may be relatively independently and easily determined by merely choosing desired impedance values.



3,571,630
TWO-TERMINAL MONOLITHIC VOLTAGE REGULATOR AND REACH-THROUGH TRANSISTOR
Robert J. Widlar, Mountain View, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.
Filed Nov. 4, 1968, Ser. No. 773,059
Int. Cl. H03k 23/08; H01l 9/00
U.S. Cl. 307—302 **9 Claims**

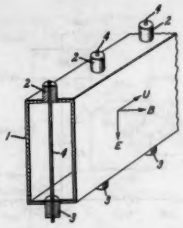


A double diffused transistor structure having a base region which is sufficiently thin so that the reverse breakdown voltage between the emitter and the collector (BV_{ecv} is less than the reverse breakdown voltage between the emitter and the base (BV_{ebo}. The transistor structure is connected in an upside-down fashion as a two-terminal network, the terminals being formed by the emitter and the collector in a manner similar to that heretofore employed with Zener diodes to provide a "reach-through" at a predetermined voltage thereacross.

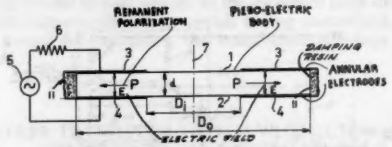
A circuit utilizing such a "reach-through" transistor structure connected in the upside-down fashion in conjunction with other components to operate the transistor structure at a constant current to maintain the reverse breakdown voltage constant.

3,571,631
ELECTRICAL DISCHARGE STABILIZER
Norman A. Evans, Wayne, Pa., assignor to General Electric Company
Filed Oct. 30, 1967, Ser. No. 678,859
Int. Cl. H02n 4/02
U.S. Cl. 310—11 **10 Claims**

An electrical discharge between electrodes on opposite sides of a high velocity gas stream tends, due primarily to gas dynamic effects, to be unstable and inefficient. An electrically nonconductive member, called a discharge holder, extended between the discharge electrodes tends to stabilize the discharge by allowing it to concentrate in the low velocity wake region downstream of said holder. Externally applied DC induced discharges, stabilized by such holders, in the entrance region of a nonequilibrium MHD generator have resulted in steady state power generation in such devices downstream of the entrance region.

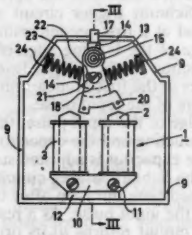


3,571,632
ELECTROMECHANICAL FILTER
Martijn de Jong, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Nov. 30, 1967, Ser. No. 687,065
Claims priority, application Netherlands, Dec. 17, 1966, 6,617,756
Int. Cl. H01v 7/00; H03h 7/10
U.S. Cl. 310—9.5 **7 Claims**



An electromechanical filter comprises a disc or flat annular member of a polarized piezoelectric material, with an electrode on each face. The region of the member between the electrodes has remanent radial polarization. Thus, the polarization and the electric field are perpendicular to each other within the same volume.

3,571,633
VIBRATOR MOTORS
Jan Timmerman, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Sept. 20, 1965, Ser. No. 488,616
Claims priority, application Netherlands, Sept. 23, 1964, 6411060
Int. Cl. H02k 33/00
U.S. Cl. 310—29 **9 Claims**



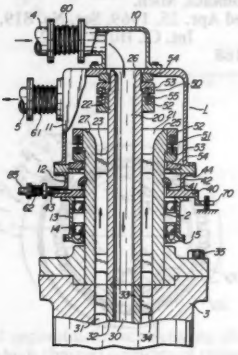
A vibrator motor comprising a bipolar stator and a multipolar armature adapted to oscillate about a stationary shaft. The armature includes first and second parts independently adjustable relative to each other.

3,571,634

COOLING LIQUID ADMITTING AND EXHAUSTING DEVICE FOR USE WITH LIQUID-COOLED ELECTRICAL ROTARY MACHINES

Hiroshi Sato, and Satoshi Suzuki, Hitachi-shi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 18, 1969, Ser. No. 877,795
Claims priority, application Japan, Nov. 25, 1968, 43/85595
Int. Cl. H02k 9/00
U.S. Cl. 310—54 6 Claims



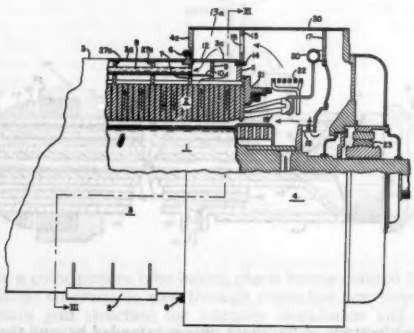
A cooling liquid admitting and exhausting device for liquid-cooled electrical rotary machines for admitting a cooling liquid from a stationary member into a rotary member and exhausting the liquid from the rotary member into the stationary member or vice versa, in which a cover assembly is so arranged as to enclose therein through sealing means a hollow rotary shaft having therein a cooling liquid admitting and exhausting passages, rotatably supported by said shaft through bearing means, and capable of following every movement of the shaft in the axial direction and vibrations thereby to positively prevent the leakage of the liquid.

3,571,635

TURBINE-GENERATOR STATOR FRAMES

Russell J. Turner, Schenectady, N.Y., assignor to General Electric Company

Filed Apr. 7, 1969, Ser. No. 813,964
Int. Cl. H02k 9/08
U.S. Cl. 310—59 2 Claims



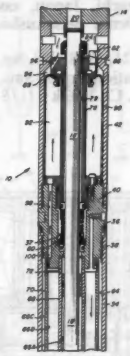
A dynamoelectric machine frame in which end sections of greater diameter are telescoped over the central section wrapper plate and sealed thereto to form a gastight frame. The gas-cooling system ducting is disposed internally in both the central section and end sections.

3,571,636

PROTECTING UNIT FOR AN OIL FIELD SUBMERSIBLE MOTOR

Joseph T. Carle, and Charles L. Choate, Tulsa, Okla., assignors to Oil Dynamics, Inc.,, Tulsa, Okla.

Filed Dec. 8, 1969, Ser. No. 882,902
Int. Cl. H02k 5/12
U.S. Cl. 310—87 2 Claims



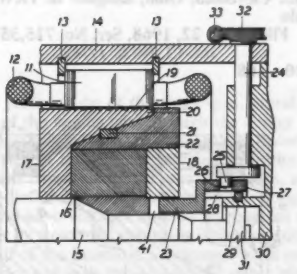
A protecting unit interposed between an oil filled submersible electrical motor and a pump includes upper and lower chambers. The lower chamber is subdivided into a plurality of reservoirs connected in series to form a unitary passageway for oil expanding upwardly incidental to a temperature rise therein caused by actuation of the motor. The upper chamber communicates with the outermost reservoir of the lower chamber and includes a collapsible membrane disposed between and sealed to the upper and lower extremities thereof to define two pressure zones whereby changes in the volume of oil in one pressure zone results in an inverse change in the volume of well fluid in the other pressure zone.

3,571,637

PERMANENT MAGNET EXCITED ELECTRIC MACHINES

Christian Johannes Henningsen, and Karl Axel Karlsson, Laxa, Sweden, assignors to Elektriska Svetsningsaktiebolaget, Goteborg, Sweden

Filed Dec. 9, 1969, Ser. No. 883,445
Int. Cl. H02k 1/22
U.S. Cl. 310—156 2 Claims



A dynamoelectric machine having a stator carrying the winding of the machine and a rotor comprising an annular, axially magnetized permanent magnet and a pair of pole units, each of which comprises a hub portion engaging one end face of the permanent magnet and a group of pole projections extending substantially towards the hub portion of the other pole unit, the pole projections of both pole units

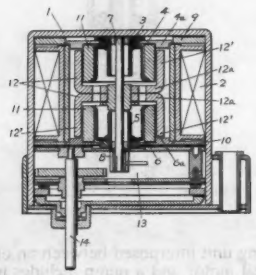
being equally spaced and interspaced with each other, said permanent magnet being surrounded by a sheath of nonmagnetic metallic material cast around the outer, cylindrical surface of the permanent magnet, said sheath filling the space between said pole projections and the permanent magnet as well as the spaces between the pole projections.

3,571,638

MINIATURE ELECTRIC SYNCHRONOUS MOTOR

Tokuzo Inariba, Katamachi, Japan, assignor to Kabushiki-Kaisha Tokai Rika Denki Seisakusho, Nishi-Kasugai-gun, Japan

Filed Jan. 21, 1970, Ser. No. 4,704
Claims priority, application Japan, Jan. 31, 1969, 44-6662
Int. Cl. H02k *21/38*
U.S. Cl. 310—155 **3 Claims**



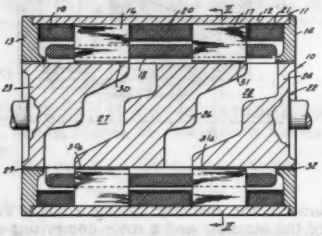
A synchronous electric motor which comprises a pair of cylindrical permanent magnets fixedly mounted at a desired spacing with their opening ends facing each other within a motor casing, an annular AC exciting coil arranged coaxially around these permanent magnets, and a rotor interposed between said pair of cylindrical permanent magnets and having upper pole teeth and lower pole teeth extending vertically at desired spacings around the circumference of a flat disc plate to a center of which the rotor shaft is fitted, said upper and lower pole teeth of rotor lying within a magnetic airgap which is formed by said pair of cylindrical permanent magnets and exciting coil, hence the upper pole teeth and the lower pole teeth are caused to efficiently interlink with the direct magnetic flux and the alternating magnetic flux, thereby improving the self-starting efficiency and producing a torque more than twice that of conventional motors of the kind.

3,571,639

DUAL-SECTION BRUSHLESS ALTERNATOR

Janis Tiltins, Cleveland, Ohio, assignor to TRW Inc,, Cleveland, Ohio

Filed Mar. 22, 1968, Ser. No. 715,355
Int. Cl. H02k *17/42*
U.S. Cl. 310—168 **6 Claims**



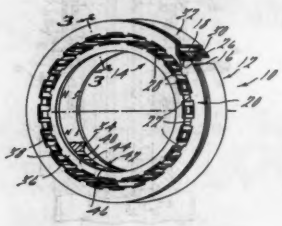
A dual-section brushless alternator having a cylindrical housing of magnetic material with two annular stators and with direct current excitation windings between the magnetic end sections of the housing and the stators and between the two stators. In one embodiment a common polyphase alternating current winding is wrapped about both stators, while in another embodiment, two separate polyphase windings are on the respective stators and energize respective diode networks whose outputs are added to provide a relatively high direct current output voltage.

3,571,640

FLUX REVERSING SENSOR

John A. Watt, Ann Arbor, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.

Filed Apr. 25, 1969, Ser. No. 819,195
Int. Cl. H02k *17/42*
U.S. Cl. 310—168 **5 Claims**



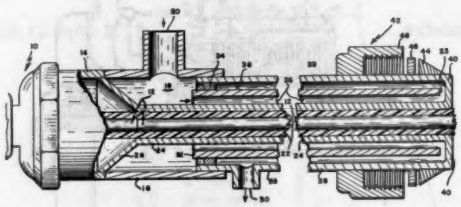
A flux reversing sensor using a single annular permanent magnet having a north and south pole and a pair of members, one of the members having a portion engaged with the north pole of the magnet and the other having a portion engaged with the south pole of the magnet, the members having fingers alternatively arranged such that the fingers of the one member has a north polarity and the fingers of the other member have a south polarity so as to establish an alternating flux field circumferentially along the magnet, the magnet is adapted to rotate relative to a stator with a coil so as to induce an alternating potential in the coil representative of the rotational speed of the magnet.

3,571,641

WATER COOLED SPARK PLUG

Carl G. Catalano, Manchester, Tenn. (226 Curtis Drive SE, Hintsville, Ala. 35803)

Filed Apr. 21, 1969, Ser. No. 817,941
Int. Cl. H01t *13/06, 13/16*
U.S. Cl. 313—11.5 **2 Claims**

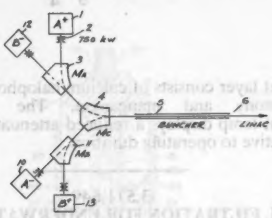


The electrode of the spark plug is extended beyond that of standard plug and is surrounded with insulation. The protruding portion of the electrode and its insulating jacket is also provided with spaced concentric copper jackets which provide ducts for running water. An inlet for one duct and an outlet for the other, together with termination of the inner jacket to provide space at each end for communication and allow continuous flow of water or other cooling fluid.

3,571,642
METHOD AND APPARATUS FOR INTERLEAVED CHARGED PARTICLE ACCELERATION

Carl H. Westcott, Deep River, Ontario, Canada, assignor to Atomic Energy of Canada Limited, Ottawa, Ontario, Canada

Filed Jan. 17, 1968, Ser. No. 698,644
Int. Cl. H05h 9/02
U.S. Cl. 313—63 9 Claims

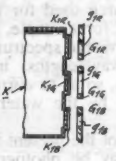


A method and apparatus for accelerating charged particles is described in which charged particles of opposite sign but of similar charge to mass ratio are accelerated through the same structure by means of an alternating electric field. The two sets of particles can be accommodated in the same apparatus by grouping particles of the same charge in bunches which are spaced by a phase difference of approximately π adians with respect to the accelerating field frequency from the bunches of the opposite charge sign.

3,571,643
PLURAL BEAM ELECTRON GUN FOR A COLOR PICTURE TUBE WITH DIFFERENT-SIZED CONTROL GRID APERTURES

Susumu Yoshida; Akio Ohgoshi, Tokyo, and Senri Miyaoka, Kanagawa-Ken, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sept. 18, 1968, Ser. No. 760,647
Claims priority, application Japan, Sept. 20, 1967, 42/60133;42/60136
Int. Cl. H01j 29/50, 31/20
U.S. Cl. 313—70 7 Claims

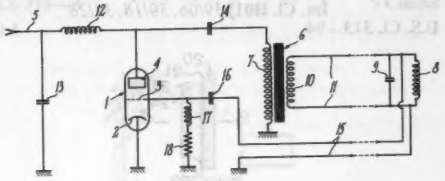


In a color picture tube having plural beams emitted from a cathode structure to pass through respective apertures of a control grid structure for intensity modulation and being focused to impinge on respective color phosphors, the relationship of beam currents required for good white balance is achieved by giving a relatively large area to the control grid aperture corresponding to the beam, particularly the green beam, which is to have a relatively high beam current. Preferably, the grid aperture of large area is divided into parts so as to achieve the necessary increased beam current without a corresponding change in the cutoff voltage.

3,571,644
HIGH FREQUENCY OSCILLATOR FOR INDUCTIVE HEATING

Albert Jakoubovitch, Buhl, France, assignor to Societe Anonyme Heurtey, Paris, France

Filed Jan. 27, 1969, Ser. No. 794,301
Int. Cl. H03b 5/10; H05b 5/00
U.S. Cl. 331—74 3 Claims



An electric current generator, notably high frequency generator, for supplying feed current to an inductor more particularly for heating purposes. Between the inductor and an oscillator tube is disposed an aperiodic impedance-matching transformer delivering low voltage current to an oscillating circuit consisting of said inductor and one or a plurality of capacitors. A line is disposed between the oscillating circuit and the oscillator tube. The function of this line is to convey the energy necessary for sustaining the oscillation.

3,571,645
COLOR PICTURE TUBE WITH MOUNTING MEANS FOR ELECTROSTATIC BEAM CONVERGENCE PLATES

Senri Miyaoka, Kanagawa-ken, Japan, assignor to Sony Corporation, Tokyo, Japan

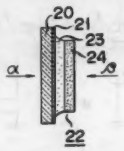
Filed Apr. 10, 1969, Ser. No. 815,051
Claims priority, application Japan, Apr. 14, 1968, 43/24593
Int. Cl. H01j 29/82, 29/74
U.S. Cl. 313—78 2 Claims

In a color picture tube of the single-gun, plural-beam type in which all of the beams pass through the center of an electron lens for focusing the beams on the color phosphor screen with two of the beams emerging from the lens along paths divergent from the optical axis of the lens, and pairs of convergence deflecting plates are arranged along the divergent paths and have voltages applied thereacross to produce electric fields by which the divergent beams are deflected for converging all of the beams at a common point on the aperture grill associated with the screen; the outer plate of each pair of convergence deflecting plates is mounted with respect to the corresponding inner plate by means of conductive members extending outwardly from the latter past the sides of the outer plate to glass or insulating members extending across the outer surface of the outer plate, and hence disposed outside the electric field, and the ends of the outer plate are preferably bent outwardly to shield the electric field from the effect of the potential of the adjacent insulating members.

3,571,646
PHOTOCONDUCTIVE TARGET WITH N-TYPE LAYER OF CADMIUM SELENIDE INCLUDING CADMIUM CHLORIDE AND CUPROUS CHLORIDE

Yuji Kiuchi; Kazuo Shimizu, Yokohama-shi, and Okio Yoshida, Kawasaki-shi, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed July 15, 1968, Ser. No. 744,743
Claims priority, application Japan, July 17, 1967, 42/45,640
Int. Cl. H01j *39/06, 39/18, 31/28*
U.S. Cl. 313—94 1 Claim

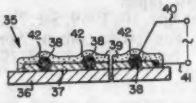


This photoconductive target comprises a photoconductive member consisting of two layers: a first layer 0.5 micron minimum thick formed on a transparent electrode and a second layer 0.6 micron maximum thick superposed on the first layer so as to be disposed on the side electron gun. The first layer is solely or mainly made of cadmium selenide, and the second layer is formed from a high resistance semiconductor material.

3,571,647
FLEXIBLE ELECTROLUMINESCENT STRUCTURES

Bessie A. Robinson, East Aurora, N.Y., assignor to Astronics Luminescent, Inc., Erie County, N.Y.

Filed Mar. 19, 1969, Ser. No. 808,627
Int. Cl. H05b *33/02*
U.S. Cl. 313—108 17 Claims



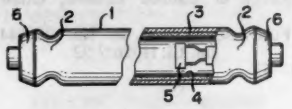
Each cell comprises a first electrode made of a deformable, electrically conductive material, and a second electrode in the form of one or more insulated, electrically conductive wires or meshes mounted on, secured to, or imbedded in, the surface of the deformable electrode. A layer of electroluminescent phosphor covers the conductors defining the second electrode, and the exposed portions of the deformable electrode. The deformable electrode is on a substrate which may be rigid or flexible, and electrically conductive or nonconductive. Fabric may be coated or impregnated with the deformable electrode; and the conductors defining the second electrode may be sewn on one or both sides of the fabric beneath a layer of electroluminescent material. When an AC voltage is applied across the electrodes, the phosphor layer luminesces with an intensity greatest in the vicinity of the second electrode.

3,571,648
EXTRA HIGH OUTPUT AND HIGH OUTPUT FLUORESCENT LAMPS

Teizo Hanada, Saitama-ken, and Akira Someya, Yokomahashi, Japan, assignors to Tokyo Shibaura Electric Co., Ltd, Kawasaki-shi, Japan

Filed Dec. 26, 1968, Ser. No. 786,958
Claims priority, application Japan, Dec. 29, 1967, 42/84355
Int. Cl. H01j *61/44*
U.S. Cl. 313—109 6 Claims

An extra high output or high output fluorescent lamp comprises first and second fluorescent layers superposed on each other. The first fluorescent layer contains at least 10 percent by weight of manganese activated magnesium fluorogermanate on the basis of the entire first layer. The second

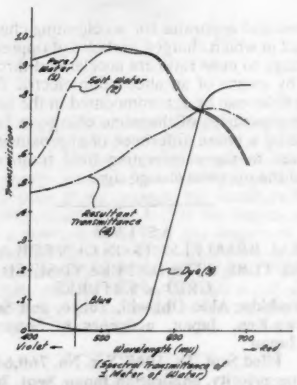


fluorescent layer consists of calcium halophosphate activated by antimony and manganese. The aforementioned fluorescent lamp displays a reduced attenuation of luminous fluxes relative to operating duration.

3,571,649
OPTICAL FILTRATION FOR UNDERWATER VIEWING, PHOTOGRAPHY, AND THE LIKE

David N. Bush, Jr., 1137 23rd st., Santa Monica, Calif.

Filed Jan. 21, 1969, Ser. No. 792,286
Int. Cl. H01j *5/16, 61/40;* H01k *1/26*
U.S. Cl. 313—112 2 Claims



The present invention provides selective color filtration devices for underwater viewing or photography, including the provision of a predetermined color-selective light-filtering coating on a light source used for underwater viewing or photography designed, for example, to absorb light in the blue-green end of the visible spectrum and to pass the red, orange and yellow wavelengths, in accordance with a predetermined formula, so as to correct to some extent the filtering effect caused by the water and by the particles suspended in the water.

When the teachings of the present invention are followed, underwater objects may be photographed in colors more natural than those heretofore possible, and without the usual bluish-greenish tinge which such objects are normally photographed by present day equipment.

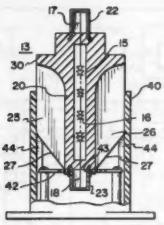
3,571,650
SEMICONDUCTOR RECTIFIER PACKAGE

Richard J. Hofmeister, Arlington Heights, and Thomas R. Steele, Lombard, Ill., assignors to Motorola Inc, Franklin Park, Ill.

Filed Dec. 4, 1968, Ser. No. 781,064
Int. Cl. H01j *5/00*
U.S. Cl. 313—317 7 Claims

A solid-state high-voltage silicon rectifier assembly is placed in a dielectric package adapted to fit within the tube enclosure conventionally used in television receivers to enclose the high voltage rectifier tube. The generally cylindrical shape of the package surrounding the rectifier elements is

flared outwardly at its upper end to form a disc surrounding the upper portion of the package. Above the disc, the package is widened so that it has approximately the same diameter as the diameter of a conventional high-voltage rectifier tube; and the terminal caps at both ends of the rectifier assembly are made the same size as the end cap used on the anode of conventional high voltage rectifier tubes. The



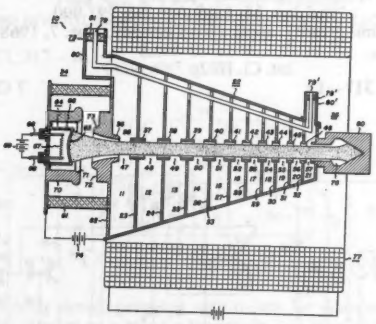
diameter of the disc is chosen to be such that the assembly cannot be inserted upside down into the tube enclosure; and a pair of flanges are provided to permit the assembly to be guided by the socket guide channels on the inside of the tube enclosure. These flanges also wedge the rectifier assembly into the tube enclosure so that it cannot easily be shaken loose.

3,571,651

LOG PERIODIC ELECTRON DISCHARGE DEVICE

Donald A. Wilbur, Tierra Verde, Fla., assignor to General Electric Company

Filed Sept. 29, 1966, Ser. No. 582,879
Int. Cl. H01j *25/34*
U.S. Cl. 315—3.5 **27 Claims**



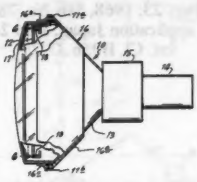
A log periodic electron discharge device is disclosed which, in one form, is an RF amplifier including a conical slow-wave circuit defining an electron beam path therethrough. The slow-wave circuit tapers in a log periodic manner for interaction with an electron beam passing therethrough. An input signal is coupled into the circuit to selectively energize a region therein based on the input signal frequency, and the beam is modulated. This modulated beam passes into a further part of the circuit to selectively energize a predetermined region therein and amplified power is taken off the circuit.

3,571,652

DEGAUSSING DEVICE FOR COLOR PICTURE TUBE HAVING PARALLEL-SLITTED BEAM-SELECTING GRID

Kenjiro Shiobara, and Yuzo Fuse, Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 14, 1969, Ser. No. 815,940
Claims priority, application Japan, Apr. 14, 1969, 43/24594
Int. Cl. H01j *29/06*
U.S. Cl. 315—8 **3 Claims**



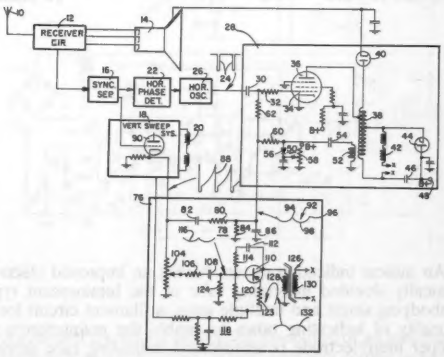
A degaussing structure for a video tube which serves to demagnetize the tube and an apertured beam-selecting member in the tube. A shroud surrounds the forward portion of the tube and the apertured beam-selecting member. A pair of degaussing coils which are connected in series are wrapped around cutout areas in the shroud at the top and bottom thereof such that the magnetic flux produced by the current carrying coils is in a direction to degauss the apertured beam-selecting member.

3,571,653

HORIZONTAL PINCUSHION CORRECTION CIRCUIT

Robert B. Hansen, Arlington Heights, and James P. McShane, Jr., Chicago, Ill., assignors to Motorola, Inc., Franklin Park, Ill.

Filed Aug. 18, 1967, Ser. No. 661,666
Int. Cl. H01j *29/76*
U.S. Cl. 315—24 **7 Claims**



The circuit includes means to develop a parabolic signal at the vertical sweep frequency for controlling the bias on the output device in the horizontal sweep system. The polarity of the signal is such as to cause increasing conduction of the device towards the top and bottom of the raster and since the output device mainly controls scan on the right side of the raster, this serves to increase distortion on the right side in order to approach the greater distortion which normally appears on the left side. The circuit further includes means to simultaneously correct the distortion on both sides and straighten the raster.

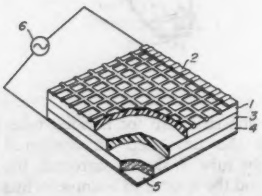
ERRATUM

For Class 315—35 see:
Patent No. 3,571,952

3,571,654
ELECTROLUMINESCENT DISPLAY SYSTEM INCLUDING A PRESELECTABLY APPLIED LOW RESISTANCE MATERIAL MEANS

Norio Suzuki, Kawasaki-shi, and Tadao Kohashi, Yokohama, assignors to Matsushita Electric Industrial Co. Ltd, Osaka, Japan

Filed Dec. 23, 1968, Ser. No. 786,248
Claims priority, application Japan, Dec. 28, 1967, 43/127
Int. Cl. H05b *33/26*
U.S. Cl. 315—59 12 Claims

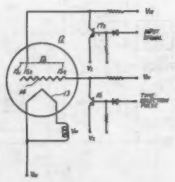


An electroluminescent display system comprising a laminated structure with an electroluminescent layer which is energized to emit light in a pattern by means of an applied electric field and a preselectably applied, low-resistance material means.

3,571,655
ELECTRONIC INDICIA DISPLAY SYSTEM

Akira Tanimoto, Yamatokoriyama-shi, Japan, assignor to Sharp Kubushiki Kaisha, Osaka, Japan

Filed Dec. 6, 1968, Ser. No. 781,876
Claims priority, application Japan, Dec. 12, 1967, Dec. 13, 1967 and Dec. 26, 1967, 42/79703; 42/79955; 42/83761
Int. Cl. H05b *37/00, 39/00*
U.S. Cl. 315—169 10 Claims



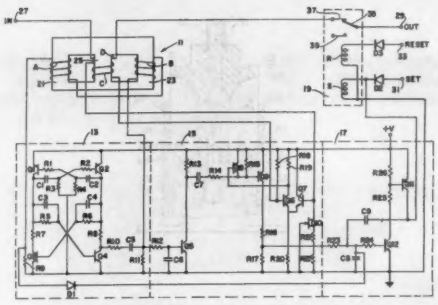
An indicia indicating system having an improved electrostatically shielded indicating tube of the luminescent type embodying single and multiple units, a filament circuit for a plurality of indicating tubes to enable the maintenance of proper interelectrode potentials and indicating tube driving circuitry to effect efficient dynamic numeral indicating and overcome abnormal luminescent functions heretofore encountered with such indicating tubes.

3,571,656
ELECTRONICALLY RESETTABLE FUSE

T. O. Paine, Administrator of the National Aeronautics and Space Administration with respect to an invention of Roland E. Genter, Falls Church, Va.

Filed May 29, 1969, Ser. No. 828,921
Int. Cl. H02h *3/08, 7/26*
U.S. Cl. 317—9 8 Claims

An electronically resettable fuse includes a saturable core current sensing transformer having two outside legs and a center leg. An oscillator is connected to balanced oscillator windings wound about the outside legs so as to produce an AC flux which saturates the outside magnetic path at waveform peak points. A DC current whose magnitude is to be sensed is passed through a control winding wound about the center leg, and produces a DC flux in the center leg which completes its loop through the two outside legs, only during intervals when the outside path is unsaturated. This

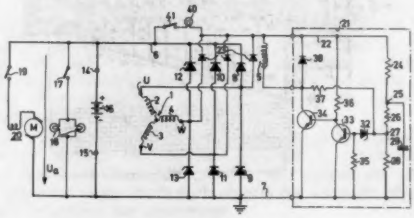


completion occurs twice per cycle and is sensed by a sense winding also wound about the center leg. When the current in the control winding surpasses a bias level, the induced DC flux direction reverses and a 180° hase shift across the sense winding occurs. This phase reversal is sensed by a phase detector and utilized to open relay contacts connected to the control winding. External means for resetting the relay from a remote location are also provided.

3,571,657
ELECTRICAL POWER SUPPLY SYSTEM FOR AUTOMOTIVE VEHICLES AND PARTICULARLY POLYPHASE BRIDGE-TYPE RECTIFIER THEREFOR

Helmut Domann, Stuttgart, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Jan. 14, 1969, Ser. No. 791,090
Claims priority, application Germany, Mar. 7, 1968, P 16 13 993.8
Int. Cl. H02p *7/06, 9/30*
U.S. Cl. 317—13 7 Claims



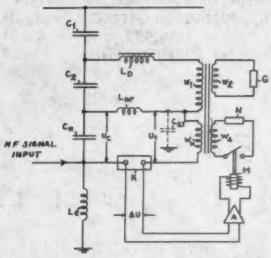
To prevent transient overvoltages in automotive-type power supply systems using three-phase alternators and full wave rectifiers connected thereto, at least one of the rectifier pairs connected to an output winding of the alternator uses breakdown-type power rectifier diodes having a breakdown voltage at least 5 percent above the nominal voltage set by the voltage regulator of the system. Connection of breakdown diodes to further, or preferably all phases provides still better protection at greater expense, however.

3,571,658

PROTECTIVE SYSTEM FOR CAPACITIVE VOLTAGE TRANSFORMERS INCLUDING A CIRCUIT FOR TfH-COUPLING

Walter Knoth, Oberengstringen, Switzerland, assignor to Micafil A. G., Zurich, Switzerland

Filed Nov. 10, 1969, Ser. No. 875,404
Claims priority, application Germany, Nov. 22, 1968, P 18 10 500.5
Int. Cl. H02h 7/04
U.S. Cl. 317—14 2 Claims



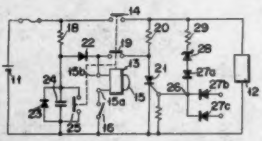
A capacitive voltage transformer comprises a transformer having its primary winding connected across an intermediate section of a plurality of capacity sections connected in series between a high voltage line and ground to form a voltage divider. The transformer is provided with a protective circuit which serves to switch in a protective damping burden on the transformer in the presence of transient oscillation phenomena, and the circuit connections between the transformer primary and the intermediate capacity section include a choke coil and a low-ohmic blocking coil to improve the transformer for coupling high frequency signals to the line for carrier type communication.

3,571,659

SWITCHING DEVICE FOR POWER SUPPLY CIRCUIT

Hiroshi Anzai, and Masaaki Hayashi, Tokyo, Japan, assignors to Tokyo Keiki Seizosho Co., Ltd., Tokyo, Japan

Filed Nov. 5, 1969, Ser. No. 874,408
Claims priority, application Japan, Nov. 8, 1968, 43/96,918
Int. Cl. H02h 3/10
U.S. Cl. 317—16 9 Claims



In a relay device provided with means for decreasing the exciting current to a value substantially less than the pickup current and adapted to connect a power supply to a load, a protective switching means responsive to faulty conditions of the power supply or load is provided to short circuit the exciting coil of the relay.

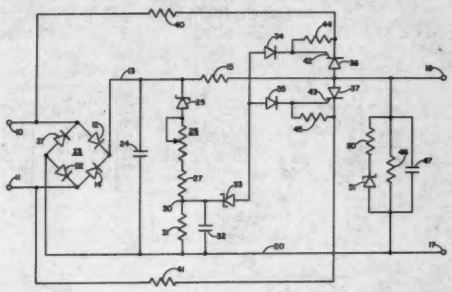
3,571,660

VOLTAGE REGULATING CIRCUIT

Harold J. Phillips, Clearwater, Fla., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 6, 1968, Ser. No. 781,858
Int. Cl. H02h 3/20
U.S. Cl. 317—16 8 Claims

A circuit for providing protection against power line high voltage surges is described. A sensor such as a Zener diode is used to detect the high voltage surge and triggers one of two silicon controlled rectifiers. The silicon controlled rectifiers are connected from the output of the protection circuit to the opposite sides of the power line to connect the output of the circuit to the negative side of the power line input during the high voltage surge.

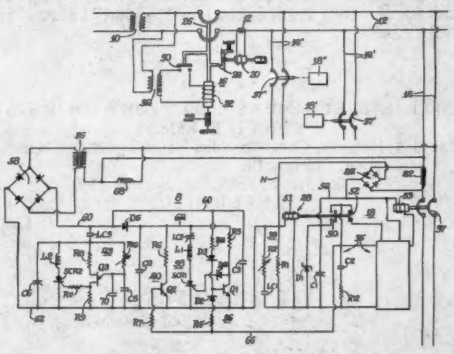


3,571,661

RESTRAINT CONTROL FOR SECTIONALIZING SWITCH

Blaine H. Schultz, and Oliver G. Attewell, South Milwaukee, Wis., assignors to McGraw-Edison Company, Elgin, Ill.

Filed Oct. 13, 1969, Ser. No. 865,862
Int. Cl. H02h 7/26, 3/24
U.S. Cl. 317—22 21 Claims



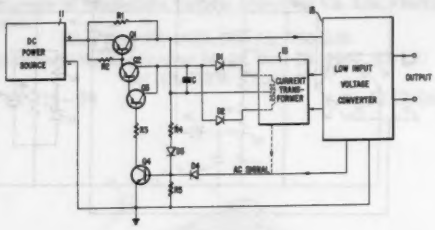
A restraint circuit for preventing operation of an automatic sectionalizing switch control which normally counts overcurrent occurrences and opens the switch after a predetermined number of overcurrent pulses occur. The restraint circuit utilizes switch control means for sensing overcurrent and includes means for sensing voltage loss. When a fault occurs in a system feeder line other than that in which the sectionalizing switch is connected and the circuit interrupter opens to deenergize the system, the restraint circuit is responsive to voltage loss unaccompanied by feeder line fault current as sensed by the switch control to prevent a counting operation by the switch control due to feeder line inrush current when the circuit interrupter recloses. The restraint circuit includes blocking means to prevent its operation when fault current is followed by voltage loss on the feeder line in which the sectionalizing switch is located.

3,571,662

FAILURE SENSING AND PROTECTION CIRCUIT FOR CONVERTER NETWORKS

T. O. Paine, Acting Administrator of the National Aeronautics and Space Administration with respect to an invention of Kenneth J. Jenson, Crystal, Minn.

Filed Feb. 4, 1969, Ser. No. 796,370
Int. Cl. H02h 7/10
U.S. Cl. 317—33 7 Claims



This disclosure describes a failure sensing and protection circuit for use with converter networks. The collector-emitter terminals of a power switching transistor are connected in series between a source of power and a converter. A sensing transistor adapted to sense the AC operation of the converter is connected through a current amplifying circuit to the base of the power transistor. In addition, proportional current drive for the power transistor is provided by connecting the current amplifier circuit through a current transformer to sense a signal that is proportional to the current flow in the collector of the power transistor. The drive to the power transistor stops when converter failure occurs because the signal applied to the sensing transistor ends.

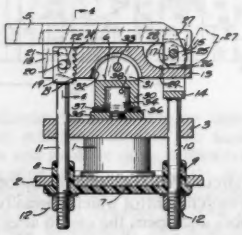
The invention described herein was made in the performance of work under a NASA contract and is subject to the provisions of Section 305 of the National Aeronautics and Space Act of 1958, Public Law 85–568 (72 Stat. 435; 42 U.S.C. 2457).

3,571,663

RELEASABLE CLAMP ASSEMBLY FOR A SOLID STATE CIRCUIT ELEMENT

Lloyd A. Hungate, Charlottesville, Va., assignor to Chemetron Corporation, Chicago, Ill.

Filed Jan. 8, 1969, Ser. No. 789,760
Int. Cl. H01l 1/12
U.S. Cl. 317—100 10 Claims



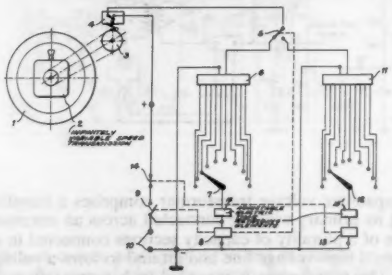
The present disclosure includes a releasable clamp holding a disclike solid state rectifier between a pair of heat sink plates. A pair of mounting bolts extends through openings in the heat sink plates to the diametrically opposite side of the rectifier. A saddle member is pivotally connected at one end to one of the support bolts and at the other end to the opposite support bolt by serrated mating surfaces. A pressure cup is pivotally interconnected to the central portion of the saddle member and telescoped over a guide toward a pressure plate which is aligned with and adapted to bear on the outer heat sink in alignment with the rectifier. A Belleville spring and a pressure control washer are interposed between the cup and the pressure plate. A lever cam is pivotally mounted to the saddle member and has a first position and a second position to compress and release the spring respectively to clamp and unclamp the rectifier.

3,571,664

TRAFFIC LINE LENGTH CONTROL APPARATUS

Ernst John, Grossauheim, and Rudi Zellmann, Frankfurt, Germany, assignors to Deutsche Gold-Und Silber-Scheideanstalt Vormals Roessler, Frankfurt am Main, Germany

Filed Sept. 18, 1968, Ser. No. 760,438
Claims priority, application Germany, Sept. 20, 1967, D36,577
Int. Cl. H01h 47/00
U.S. Cl. 317—140 8 Claims



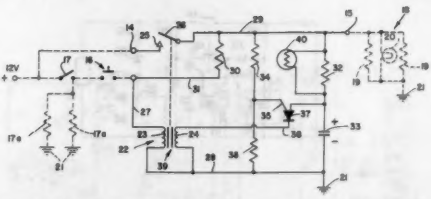
The length of continuous or dashed highway traffic lines being painted by a machine is automatically controlled by a vehicle driven cam switch selectively joined to a pair of storage relay counting devices which set the length of time the machine paints continuous lines or dashed lines on the highway.

3,571,665

LONG INTERVAL TIMING CIRCUIT

Rodney Hayden, Wentworth, Ontario, Canada, assignor to United-Carr Incorporated, Boston, Mass.

Filed May 7, 1969, Ser. No. 822,526
Int. Cl. H01h 47/32
U.S. Cl. 317—142 2 Claims



This is a timing device having only electrical terminals and using a relay with a bucking coil. One of the coils of the relay activates the timing cycle while the bucking coil, after a predetermined time cancels the cycle.

3,571,666

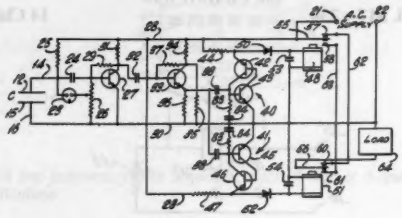
DOUBLE-ACTION CAPACITANCE-RESPONSIVE SWITCHING CIRCUIT

Francis A. McGuirk, Jr., Chatham, N.J., assignor to Wagner Electric Corporation

Filed Apr. 12, 1968, Ser. No. 720,889
Int. Cl. H01h 47/22
U.S. Cl. 317—146 9 Claims

The variations in capacitance to ground of an antenna due to proximity or remoteness of a person or object causes

variations in the output of an oscillator. In one embodiment, when antenna capacitance either increases or decreases with respect to a predetermined level, the oscillator output decreases or increases (respectively) and thereby causes switching circuitry to energize or deenergize (respectively)



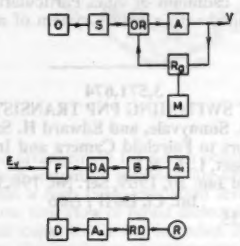
both of two relays, thus causing energization of a load. At the normal antenna capacitance, one relay is energized and the other is deenergized, and the load is deenergized. In a second embodiment, the same load-controlling functions are achieved with a circuit employing a single relay.

3,571,667

TRACK CIRCUIT OF GREAT LENGTH

Jean Demeur, Brussels, Belgium, assignor to Ateliers de Constructions Electriques de Charleroi (ACEC), Charleroi, Belgium

Filed Mar. 14, 1969, Ser. No. 807,237
Claims priority, application Belgium, Mar. 14, 1968, 55773
Int. Cl. B61l 1/02; H01h 47/20
U.S. Cl. 317—147 **7 Claims**



The disclosure relates to a track circuit for detecting the presence of a train on a long section of a railway track equipped with an AC traction power line, wherein the two rails of the section are insulated from the adjoining sections at each end thereof, comprising a generator connected to one end of the railway section for generating a voltage at a frequency which is approximately equidistant from the fundamental frequency of the power line and from the second harmonic thereof, the generated voltage comprising a series of pulse trains having a very low repetition rate. The track circuit also comprises a receiver for detecting the generated voltage at the opposite end of the railway section. The receiver includes an amplitude discriminator for eliminating the signals the amplitude of which is lower than a predetermined level and a selective demodulator which provides an output only when its input is energized by a signal at the above-mentioned repetition rate.

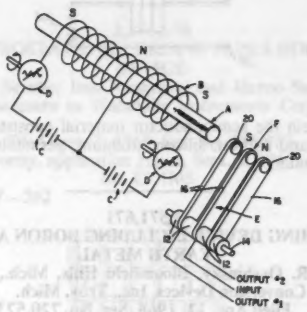
3,571,668

THREE-POSITION SOLENOID ACTUATED SWITCH

Frank E. Gray, 2070 Lathan St. 10, Mountain View, Calif.

Filed Nov. 13, 1969, Ser. No. 876,512
Int. Cl. H01h 51/22
U.S. Cl. 317—150 **10 Claims**

A solenoid switch having first and second closed positions with an open position therebetween. A center-tapped coil is wound about a core capable of conducting a magnetic field. Direct current of one polarity is applied between the center tap and one coil end; direct current of the same polarity is applied between the center tap and opposite end. A three-position reed switch having a permanent magnet attached thereto is positioned adjacent the core. By the expedient of



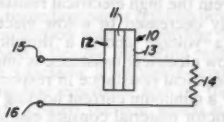
providing a reference impedance in series with the direct current between the center tap and one end of the coil and a comparison impedance between the center tap and the other end of the coil, the reed switch can be moved to any of its three positions.

3,571,669

CURRENT CONTROLLING DEVICE UTILIZING SULPHUR AND A TRANSITION METAL

Gordon R. Fleming, Pontiac, Mich., assignor to Energy Conversion Devices, Inc., Troy, Mich.

Filed Mar. 4, 1968, Ser. No. 710,033
Int. Cl. H01l 9/00
U.S. Cl. 317—234 **8 Claims**



A current-controlling device for an electrical circuit including a semiconductor material and electrodes in contact therewith, wherein the semiconductor material has a high electrical resistance, wherein the high electrical resistance is substantially instantaneously decreased to a low electrical resistance in response to a voltage above a threshold voltage value, wherein the low electrical resistance is immediately returned to the high electrical resistance in response to a decrease in current below a minimum current holding value, and wherein the semiconductor material consists essentially of sulfur and a transition metal, as for example, vanadium.

3,571,670

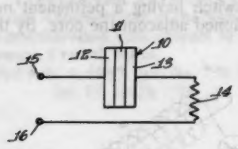
SWITCHING DEVICE INCLUDING BORON AND SILICON, CARBON OR THE LIKE

Stanford R. Ovshinsky, Bloomfield Hills, Mich., assignor to Energy Conversion Devices, Inc., Troy, Mich.

Filed Apr. 11, 1968, Ser. No. 720,572
Int. Cl. H01l 9/10
U.S. Cl. 317—234 **6 Claims**

A current switching device for an electrical circuit including a semiconductor material and electrodes in contact therewith, wherein the semiconductor material has a high electrical resistance, wherein the high electrical resistance is substantially instantaneously decreased to a low electrical resistance in response to a voltage above a threshold voltage value, wherein the low electrical resistance is immediately

returned to the high electrical resistance in response to a decrease in current below a minimum current-holding value,

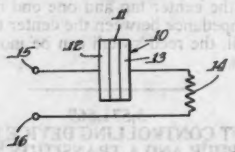


and wherein the semiconductor material consists essentially of boron and carbon, silicon, titanium, germanium, zirconium or hafnium.

3,571,671
SWITCHING DEVICE INCLUDING BORON AND RARE EARTH METAL

Stanford R. Ovshinsky, Bloomfield Hills, Mich., assignor to Energy Conversion Devices, Inc., Troy, Mich.

Filed Apr. 11, 1968, Ser. No. 720,573
Int. Cl. H01l *9/10*
U.S. Cl. 317—234 **6 Claims**

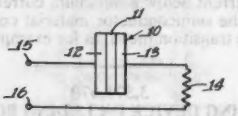


A switching device for an electrical circuit including a semiconductor material and electrodes in contact therewith, wherein the semiconductor material has a high electrical resistance, wherein the high electrical resistance is substantially instantaneously decreased to a low electrical resistance in response to a voltage above a threshold voltage value, wherein the low electrical resistance is immediately returned to the high electrical resistance in response to a decrease in current below a minimum current holding value, and wherein the semiconductor material consists essentially of boron and a rare earth metal, as for example, yttrium.

3,571,672
SWITCHING DEVICE INCLUDING SILICON AND CARBON

Stanford R. Ovshinsky, Bloomfield Hills, Mich., assignor to Energy Conversion Devices, Inc., Troy, Mich.

Filed Apr. 11, 1968, Ser. No. 720,574
Int. Cl. H01l *9/00*
U.S. Cl. 317—234 **9 Claims**

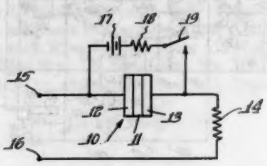


A switching device for an electrical circuit including a semiconductor material and electrodes in contact therewith, wherein the semiconductor material has a high electrical resistance, wherein the high electrical resistance is substantially instantaneously decreased to a low electrical resistance in response to a voltage above a threshold voltage value, wherein the low electrical resistance is immediately returned to the high electrical resistance in response to a decrease in current below a minimum current holding value, and wherein the semiconductor material consists essentially of silicon and carbon.

3,571,673
CURRENT CONTROLLING DEVICE

Stanford R. Ovshinsky, Bloomfield Hills, and Gordon R. Fleming, Pontiac, Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Aug. 22, 1968, Ser. No. 754,533
Int. Cl. H01l *9/00*
U.S. Cl. 317—234 **14 Claims**

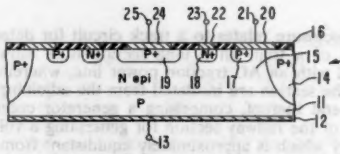


A current controlling device for an electrical circuit including a semiconductor material and electrodes in low electrical resistance contact therewith, wherein said semiconductor material has a high electrical resistance to provide a blocking condition for substantially blocking current therethrough, wherein the high electrical resistance is substantially instantaneously decreased to a low electrical resistance in response to a voltage above a threshold voltage value, wherein the semiconductor material in the low electrical resistance conducting condition has a voltage drop which is a fraction of the voltage drop in the high electrical resistance blocking condition near the threshold voltage value, and wherein the semiconductor material is a multielement nonchalcogenide material including as essential ingredients arsenic or phosphorous and silicon, germanium, gallium, boron or aluminum. The material may also include minor additions, such as, cadmium or zinc. Particularly good results have been obtained with a binary system of arsenic and silicon.

3,571,674
FAST SWITCHING PNP TRANSISTOR

Albert Y. C. Yu, Sunnyvale, and Edward H. Snow, Mt. View, Calif., assignors to Fairchild Camera and Instrument Corporation, Syosset, L. I., N.Y.

Filed Jan. 10, 1969, Ser. No. 790,317
Int. Cl. H01l *11/06*
U.S. Cl. 317—235 **5 Claims**



The on-off switching time of a PNP transistor is significantly decreased by placing a Schottky Barrier diode in parallel with the collector-base PN junction of the transistor.

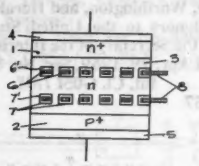
3,571,675
CONTROLLED SEMI-CONDUCTOR WAFER HAVING ADJACENT LAYERS OF DIFFERENT DOPING CONCENTRATIONS AND CHARGED INSERT GRID

Werner Faust, Wettingen, Switzerland, assignor to Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland

Filed Sept. 24, 1969, Ser. No. 860,844
Claims priority, application Switzerland, Oct. 21, 1965, 14554
Int. Cl. H01l *11/14*
U.S. Cl. 317—235 **4 Claims**

A controlled semiconductor wafer includes at least one p-n junction and adjacently disposed layers of different doping

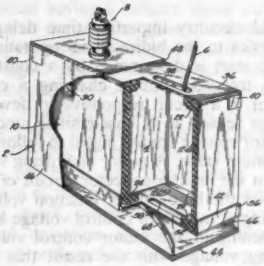
concentration, there being a charged gridlike insert in the layer of lower doping concentration and located in the vicinity of the junction to the adjacent layer of higher doping concentration.



3,571,676
POWER CAPACITORS

David D. Hottinger, South Milwaukee, Wis., assignor to McGraw-Edison Company, Elgin, Ill.

Filed June 16, 1969, Ser. No. 833,371
Int. Cl. H01g 1/08
U.S. Cl. 317—242 8 Claims

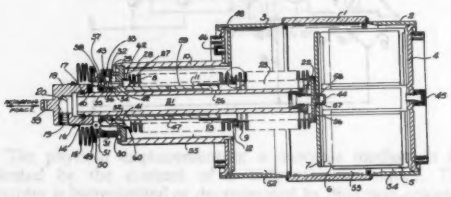


An insulation arrangement for a high potential capacitor is provided in which insulation members are arranged and have shapes such that a high basic insulation level is maintained while at the same time flow of liquid dielectric coolant within the tank of the capacitor is not impeded by the insulation members. Also, the insulation members are such that additional liquid reservoir space is provided for cooling the capacitor.

3,571,677
SINGLE BELLOWS WATER-COOLED VEHICLE CAPACITORS

Joseph E. Oeschger, Palo Alto, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Dec. 31, 1969, Ser. No. 889,531
Int. Cl. H01g 1/08
U.S. Cl. 317—243 10 Claims

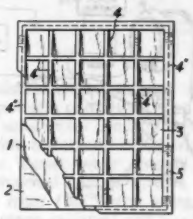


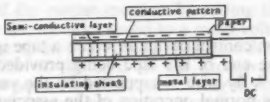
A fluid cooled vacuum capacitor in which only a single metal bellows is required. Coolant is directed down the hollow center of the main shaft to the device and returns in a counterflow direction in the space between the shaft-bearing sleeve subassembly and the internal surface of the bellows. A unique fluid sealing arrangement includes primary and secondary shaft seals of the chevron type with circumferential expander springs and a leakage relief path between seals. Shaft bearings are metal-to-metal type and are fluid lubricated.

3,571,678
ELECTROSTATIC RECORDING PAPER HOLDING DEVICE

Muneyoshi Sezako; Isao Nagayasu, and Haruo Sato, Tokyo, Japan, assignors to Watanabe Instruments Corp., Tokyo, Japan

Filed Sept. 3, 1968, Ser. No. 756,953
Claims priority, application Japan, Sept. 4, 1967, 42/75304
Int. Cl. H05
U.S. Cl. 317—262 11 Claims



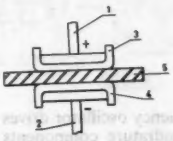


An electrostatic recording paper holding device adapted to be employed in connection with a recording instrument and comprising as its base a flexible insulating resin sheet or film having on one side a metallic layer vapor-deposited or in adhesion which forms one electrode and on the other side a semiconductor layer coated thereon which supports a conductive pattern provided with a plurality of openings therein which in turn supports a metallic frame at portion thereof, and an electric circuit connected to said metallic layer and conductive pattern and including a switch and DC power source.

3,571,679
DEVICE FOR FORMING ELECTRETS

Jan Van Turnhout, Delft, Netherlands, assignor to Nederlandse Organisatie voor Toegepast-Natuurwetenschappelijk Onderzoek ten behoeve van Nijverheid, Handel en Verkeer, The Hague, Netherlands

Filed Oct. 8, 1969, Ser. No. 864,755
Claims priority, application Netherlands, Oct. 14, 1968, 6814644
Int. Cl. H01g 7/02
U.S. Cl. 317—262 1 Claim



A device for forming electrets with an open structure, which is provided with electrodes which are covered with a

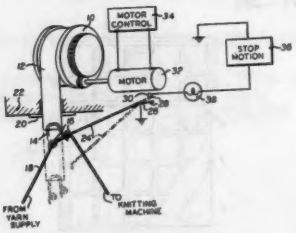
material, the specific resistance of which is a factor of 10^4 —10^8 maller than that of the electret material and the thickness of which is chosen such that it can stand the forming voltage applied without the occurrence of a dielectric breakdown.

3,571,680

YARN TENSION CONTROL DEVICE

Edward M. Tellerman, East Rockaway; Nathan J. Tellerman, Hewlett Harbor, and Robert L. Handelsman, Commack, N.Y., assignors to Stop-Motion Devices Corporation, Plainview, N.Y.

Filed June 5, 1968, Ser. No. 734,742
Int. Cl. B65h *59/38*
U.S. Cl. 318—6 **18 Claims**



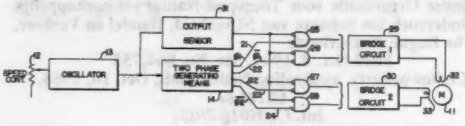
A yarn tension control device in which a tape is wound on a roller with the end of the tape being provided with yarn carrying loops. A fly wire is supported by the yarn between the loops during normal operation of the associated knitting machine. An increase in yarn tension beyond the permissible range causes downward movement of the yarn carrying loops, releasing the fly wire from its support by the yarn, and causing completion of an electrical circuit which activates the stop motion for the knitting machine. The tape carrying roller is driven by a motor which is controlled so that the tape can be unwound from the roller, wound onto the roller and, for purposes of adjusting the yarn tension, have a preselected static force applied to the tape.

3,571,681

CONTROLLABLE SPEED MULTIPLE PHASE MOTOR

Stephen K. Burns, Cambridge, Mass., assignor to Herbert Berman, Brookline, Mass.

Filed May 19, 1969, Ser. No. 825,597
Int. Cl. H02p *5/40*
U.S. Cl. 318—227 **2 Claims**



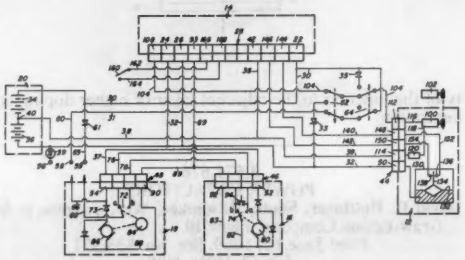
A variable frequency oscillator drives a two-phase generator to provide quadrature components at a quarter of the oscillator frequency. These signals in phase quadrature are applied to respective gate-pairs that are enabled in synchronism with the oscillator output. Each gate-pair drives a respective power amplifying bridge to which a respective motor winding is connected to apply a peak-to-peak drive to each winding that is about twice the DC voltage available from the power supply.

3,571,682

SERVOCONTROL WITH TIME DELAY AND RAMP MOTOR START

Duane M. Preble, Worthington, and Harold O. Wires, Columbus, Ohio, assignors to the United States of America as represented by the Secretary of the Interior

Filed Apr. 29, 1969, Ser. No. 820,177
Int. Cl. G05f *1/08*
U.S. Cl. 318—257 **7 Claims**



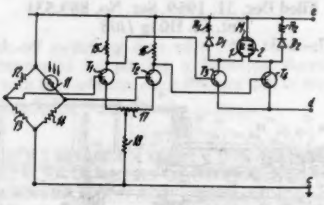
Motor control circuitry imparting time delay and ramp start characteristics to the bidirectional operation of a servomotor. Ramp start is determined by a constant current generated in a transistor circuit charging a capacitor. A further transistor in a circuit responsive to development of the ramp voltage sensed at its base-emitter junction directs growth of a motor voltage control signal to follow ramp form towards a maximum value. A motor energizing voltage feedback received in the emitter-collector circuit of the further transistor opposes the base-emitter junction voltage and effects a dampening of the motor control voltage buildup until consequent lessening of the motor control voltage lessens motor energizing voltage with the result that the further transistor acts to further develop the motor control voltage whereby the effect of the feedback loop thus made operative is progressively diminished as motor energizing voltage is permitted to follow a ramp form to its normal operational value.

3,571,683

SERVOMECHANISM WITH DRIVING ROTOR WINDING AND BRAKING ROTOR WINDING

Claudio Prezzi, Yverdon, and Giovanni Odone, LaRosiz Surlausane, Switzerland, assignors to Paillard S. A., Vaud, Switzerland

Filed Jan. 30, 1968, Ser. No. 701,694
Claims priority, application Switzerland, Feb. 17, 1967, 2338/67
Int. Cl. H02p *5/04*
U.S. Cl. 318—258 **11 Claims**

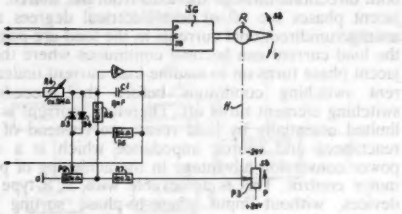


A commutator-type electric motor with two windings, one of which is energized by a control current, for driving the motor, and the other of which furnishes a braking torque, whereby the motor is stopped without overshooting.

3,571,684
RUDDER POSITIONING UNIT FOR THE STEERING SYSTEMS OF SHIPS

Mogens Ilsted Bech, Birkerd, Denmark, assignor to Decca Limited, London, England

Filed Aug. 12, 1969, Ser. No. 849,802
Int. Cl. G05d *1/00*; B63h *25/02*
U.S. Cl. 318—588 5 Claims

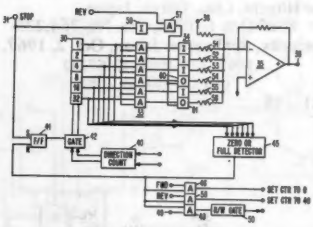


A rudder positioning unit for the steering systems of ships serves to position the rudder at an angle proportional to a rudder positioning signal received by the unit, and comprises a balance circuit having a balance signal output controlling start and stop of the steering gear of the ship, said balance circuit having inputs for the rudder positioning signal and for a feedback signal from a steering gear simulator, that is started and stopped simultaneously with the steering gear and is capable of simulating the movement of the steering gear, but at a smaller time lag than the latter or practically no time lag at all, preferably in the form of an electrical voltage. Means are provided for continuously effecting slow synchronization of the simulator with the steering gear, and for effecting quick synchronization on occurrence of a predetermined deviation between the simulator and the steering gear. A preferred form of a steering gear simulator is an electronic integrator circuit.

3,571,685
NUMERICAL SERVO DISPLACEMENT CONTROL SYSTEM

Vaughn E. Akins; John P. Harris, and Frederick H. Kost, Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 15, 1968, Ser. No. 697,853
Int. Cl. G05b *19/28*
U.S. Cl. 318—603 4 Claims

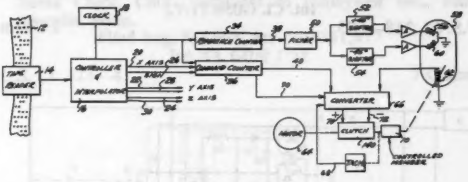


The physical displacement of a movable medium is indicated by the content of a bidirectional counter. The counter is incremented or decremented by direction-oriented pulses relating to movement of the medium, these pulses being selectively gated into the counter. The content of the counter can control an operational amplifier to provide an indication of the position of the medium relative to a null point represented by any selected count in the counter.

3,571,686
NUMERICALLY CONTROLLED PATH SYSTEM WITH ON-OFF SERVO

Hubert B. Henegar, Detroit, Mich., assignor to The Bendix Corporation

Filed June 2, 1967, Ser. No. 643,197
Int. Cl. G05b *5/01*
U.S. Cl. 318—624 12 Claims

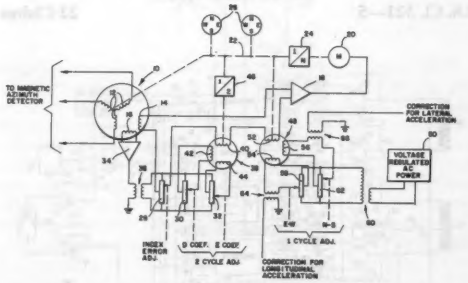


A converter is disclosed for operating on the proportional control signal output of a contouring-type numerical control system to make it suitable for use with an on-off servo of the type employed with tracer-controlled machines. The converter accepts the square wave outputs of the command counter of the numerical control system, the output of the feedback resolver rotor (the stator being energized by the output of the reference counter) and a voltage proportional to the rate of motion of the controlled machine member. When the first zero crossing occurs of the command or feedback wave a time delay is initiated which is proportional to the speed of the output member by adding the voltage proportional to the member speed to a ramp voltage initiated at the crossover of the appropriate wave, and detecting the zero crossing point of the sum. If the crossover point of the second input square wave occurs during the delay period no control signal is provided to the output servo. Therefore, a dead zone proportioned in width to the speed of the output member is created. If the square wave signal crossing occurs after the time delay an output signal to the servo is provided of a sign dependent upon which of the input square waves crossed zero first.

3,571,687
METHOD AND APPARATUS FOR PROVIDING ERROR COMPENSATION IN A DATA TRANSMISSION SYSTEM

Arthur F. Larwin, Grand Rapids, Mich., assignor to Lear Siegler, Inc.

Filed Sept. 20, 1968, Ser. No. 761,244
Int. Cl. G05b *13/02*
U.S. Cl. 318—632 14 Claims



In a magnetic azimuth detector system employing a servo transmission network between the input and a remote readout, error correction is provided by inserting correction signals into the servo transmission system. The servo transmission system employs a control transformer having null and 90° utput windings and error compensation is effected

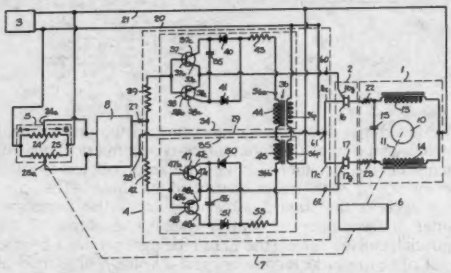
by summing index, one cycle and two cycle error correction signals with the signal across the null output winding.

3,571,688

PHASE DISCRIMINATING CONTROL APPARATUS FOR A BIDIRECTIONAL SOLID-STATE AC POSITION SERVOMOTOR CONTROL

Walter Tomasulo, Jr., Wayne, and George R. Brown, Emerson, N.J., assignors to Hoke Incorporated, Cresskill, N.J.

Filed Oct. 24, 1968, Ser. No. 770,347
Int. Cl. G05b *11/12*
U.S. Cl. 318—683 **1 Claim**



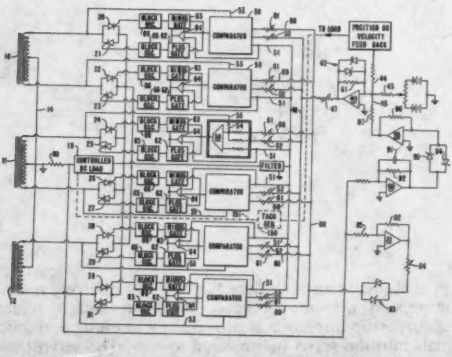
A phase discriminating control apparatus which will provide one of two alternating current outputs depending upon which of two alternating current inputs to the apparatus is leading. Each of the two inputs is coupled to one of two coupled firing circuits where the phase relationship between the input signals is determined. Each of the firing circuits is coupled to a bidirectional silicon thyristor and each of the thyristors is coupled to an alternating current source. The leading input signal to the apparatus results in one firing circuit gating one of the thyristors "on" while the other firing circuit gates the other thyristor "off." The thyristor gated "on" supplies an alternating current to the output. If the input signals change their phase relationship so that the leading signal is the former lagging signal, then the operation of the circuit causes the output voltage to appear at the thyristor which was formerly "off" and the remaining output thyristor will be turned off.

3,571,689

CIRCUIT FOR SUPPLYING CONTROLLED DC LOADS FROM POLYPHASE AC SOURCES

William L. Wise, Mountain View, Calif., assignor to Tydeman Machine Works, Inc., Redwood City, Calif.

Filed Feb. 13, 1969, Ser. No. 798,969
Int. Cl. H02m *7/00*
U.S. Cl. 321—5 **22 Claims**



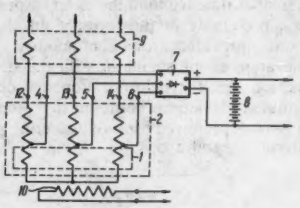
A unique control circuit for supplying DC loads from polyphase alternating current sources incorporates rectifying switching means in a transformer output which are connected in series with a DC load wherein the reference voltage is the load voltage and associated trigger circuits control the firing angle of rectifying switching means relative to that reference voltage and a command signal, so that phase-to-load switching is accomplished as and only when the individual phase voltage approaches the reference voltage. Each phase of the source has two rectifying switching means associated therewith whereby current can be made to flow in both directions through the load from the source. When adjacent phases are 60 or less electrical degrees apart high average unidirectional currents in the load are possible since the load current can become continuous where the next adjacent phase turns on to assume load current under high-current switching conditions before the preceding phase switching element turns off. Therefore, current is then only limited essentially by load resistance (instead of the usual reactance) and source impedance which is a substantial power conversion advantage in the achieving of precise DC motor control. This is achievable with SCR-type switching devices, without input phase-to-phase sorting problems, because triggering can only occur when phase voltage magnitude is approaching E-load, either from above or below.

3,571,690

POWER GENERATING UNIT FOR RAILWAY COACHES

Voldemar Voldemarovich Apsit, ulista V. Latsisa, 2-a, Kv.21, Riga, U.S.S.R.

Filed Oct. 25, 1968, Ser. No. 770,547
Claims priority, application U.S.S.R., Oct. 30, 1967, 1193648
Int. Cl. H62m *7/00*
U.S. Cl. 321—8 **2 Claims**



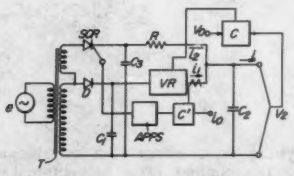
A power-generating unit for railway coaches which comprises a synchronous electrical machine connected to the coach circuits through a rectifier.

3,571,691

REGULATED DC POWER SUPPLY

Koji Iwata, and Kenjiro Yokoyama, Hitachi-shi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 1, 1968, Ser. No. 764,235
Claims priority, application Japan, Oct. 2, 1967, Oct. 20, 1967, 42/63047; 42/67242
Int. Cl. H02m *7/20*
U.S. Cl. 321—18 **2 Claims**



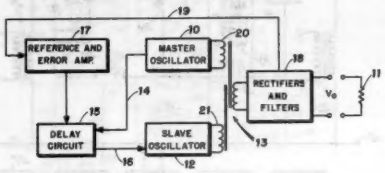
A regulated DC power supply consisting of a voltage regulating circuit which supplies the load with a current just to compensate the variation in the load current and another circuit connected in parallel to said voltage regulating circuit which supplies the remaining and constant portion of the

load current, thereby making it possible to reduce the necessary current bearing capacity of the regulating components.

3,571,692
STEP WIDTH REGULATED DC/DC CONVERTER

Carl F. Andren, St. Petersburg, Fla., assignor to the United States of America as represented by the Secretary of the Navy

Filed July 1, 1969, Ser. No. 838,140
Int. Cl. H02m 7/48
U.S. Cl. 321—18 9 Claims

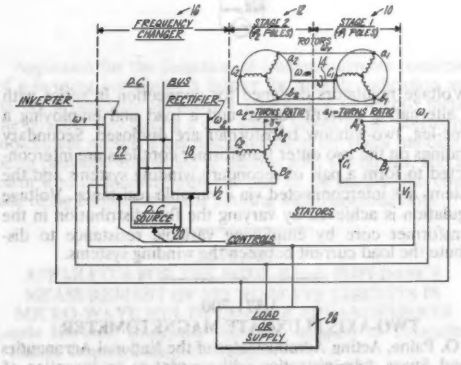


A feedback regulated DC/DC converter is disclosed. More particularly, an unregulated master oscillator feeds square waves into one core of a dual-core transformer, and a slave oscillator (whose output amplitude is a predetermined fraction of the master oscillator's output amplitude) also feeds square waves into the other core of the transformer. A sample of the transformer output after it has been rectified and filtered is compared against a reference value and the difference between the output value and the reference value produces an error current which is fed into a delay circuit The delay circuit will then synchronously adjust the output phase of the slave oscillator. Thus, the average voltage appearing across the secondary of the dual-core transformer is varied by adjusting the relative phase between the master and the slave oscillator. Since the slave oscillator operates at only a small percent of the master oscillator's output, step-width modulation, rather than the standard pulse width modulation, results.

3,571,693
CONSTANT FREQUENCY OUTPUT TWO-STAGE INDUCTION MACHINE SYSTEMS

Mahmoud Riaz, Minneapolis, Minn., assignor to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Nov. 21, 1968, Ser. No. 777,818
Int. Cl. H02p 9/42
U.S. Cl. 322—32 12 Claims

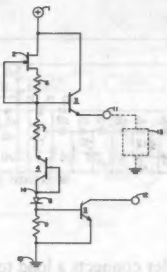


A system employing double-induction machines and being capable of providing constant-frequency electrical power from a variable speed drive or of operating as a controlled speed motor from a constant-frequency source. The disclosed system employs two polyphase, wound-rotor induction machines mounted on the same shaft and having their rotor windings connected in a reverse phase sequence and their stator windings interconnected by means of a direct-current link-type of static frequency changer.

3,571,694
DC VOLTAGE REGULATOR EMPLOYING AN FET CONSTANT CURRENT SOURCE AND CURRENT FLOW INDICATOR

Jack W. Hunger, Hennepin, Minn., and David D. Kemp, Santa Clara, Calif., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 8, 1968, Ser. No. 751,077
Int. Cl. G05f 1/58
U.S. Cl. 323—4 7 Claims

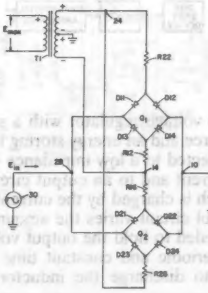


A DC voltage regulator employing a constant current source and a voltage reference source to control a variable impedance to regulate an input voltage. A low voltage sensing output is provided by using a sensing transistor as a switch and temperature compensation element. The sensing transistor functions as a voltage responsive switch to produce a signal indicative of the level of the input voltage relative to a predetermined level. The sensing transistor is normally saturated to connect the sensing output to the ground.

3,571,695
LOW DISTORTION AC LIMITER

Robert L. Straiton, Orlando, Fla., assignor to the United States of America

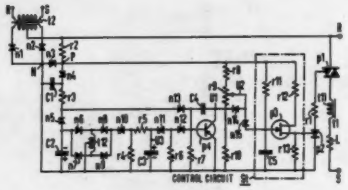
Filed May 27, 1969, Ser. No. 828,179
Int. Cl. G05f 1/12
U.S. Cl. 323—9 6 Claims



An alternating current limiter that does not require a harmonic output filter. A reference signal is coupled through a step-up transformer with a center-tapped secondary and is applied across a quad of diodes. The reference signal is inverted and applied across a second quad of diodes. An input signal is applied to both diode quads adjacent to the reference signal input. An output from both quads is connected to a load. The quads conduct alternately and the output signal therefrom is a duplicate of the input signal or a

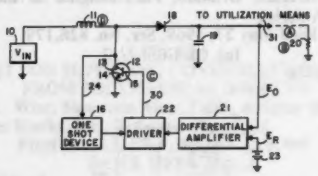
function of the reference signal if the input signal magnitude exceeds a limiting value. The reference signal is either in phase or 180° ut of phase with the input signal.

3,571,696
ALTERNATING CURRENT CONTROLLER WITH START-UP DELAY
Manfred Liska, and Aubert Martin, Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin, Germany
Filed Dec. 18, 1969, Ser. No. 877,660
Claims priority, application Germany, Dec. 25, 1968, P 18 10 760.3
Int. Cl. G05f *1/40, 1/52, 1/60*
U.S. Cl. 323—22 **3 Claims**



An AC controller connects a load to an AC voltage source and has a control unit for providing output control pulses in synchronism with the voltage of the source. An RC circuit connected to the control unit has a load capacitor and a load resistor for controlling the phase position of the control pulses in accordance with the time constant of the RC circuit.

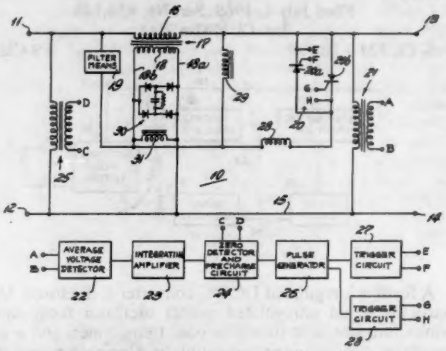
3,571,697
VARIABLE IMPEDANCE SWITCHING REGULATOR
Donald E. Phillips, Cedar Rapids, Iowa, assignor to Collins Radio Company, Dallas, Tex.
Filed Dec. 16, 1968, Ser. No. 783,930
Int. Cl. G05f *1/56*
U.S. Cl. 323—17 **21 Claims**



A DC step-up voltage regulator with a series arrangement of a raw DC source and an energy storing inductor which are alternately connected to a low impedance circuit to build up the inductor current and to an output circuit which includes a capacitor which is charged by the current flow from the inductor. A control circuit varies the amount of inductor current buildup needed to hold the output voltage constant and also provides periodic and constant time intervals of sufficient duration to discharge the inductor current into the capacitor.

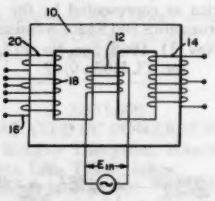
3,571,698
LOW DISTORTION AUTOMATIC VOLTAGE REGULATOR HAVING CONTROLLED RECTIFIERS
Owen J. McCabe, Bristol, Conn., assignor to The Superior Electric Company, Bristol, Conn.
Filed Feb. 17, 1969, Ser. No. 799,629
Int. Cl. H02p *13/04, 13/16;* **H02m** *5/12*
U.S. Cl. 323—24 **6 Claims**

An automatic voltage regulator for providing a substantially constant output voltage by regulating the input voltage with a transformer that has a secondary winding connected between the input and output of the regulator and a primary winding connected to controlled rectifiers so that control of the conduction of the rectifiers alters the voltage in the transformer to regulate the input voltage. A harmonic voltage filter is also connected to the primary winding in parallel with



the controlled rectifiers to substantially minimize the percentage of distortion caused by the controlled rectifiers in the output of the regulator by shunting the harmonic voltages back to the controlled rectifiers. The filter also provides a voltage that is in opposition to the controlled rectifier voltage in the primary winding and is employed to regulate the input voltage at some operating conditions of the regulator.

3,571,699
VOLTAGE REGULATOR
Sherwood Thaler, Lexington, Mass. Administrationthe United States of America as represented by the Administrator of the National Aeronautics and Space Administration
Filed Oct. 13, 1969, Ser. No. 865,811
Int. Cl. H01f *19/00, 29/00*
U.S. Cl. 323—48 **3 Claims**

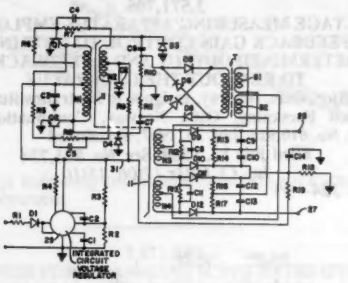


Voltage regulators designed for connection in series with an alternating current source and a load and employing a three-leg, two-window transformer are disclosed. Secondary windings on the two outer transformer core legs are interconnected to form a pair of secondary winding systems and the systems are interconnected via a variable resistance. Voltage regulation is achieved by varying the flux distribution in the transformer core by employing variable resistance to distribute the load current between the winding systems.

3,571,700
TWO-AXIS FLUXGATE MAGNETOMETER
T. O. Paine, Acting Administrator of the National Aeronautics and Space Administration with respect to an invention of Charles J. Pellerin, Jr., and Mario H. Acuna, Greenbelt, Md.
Filed Dec. 10, 1968, Ser. No. 782,544
Int. Cl. G01r *33/02*
U.S. Cl. 324—43 **2 Claims**

This disclosure describes a two-axis fluxgate magnetometer. A toroidal sensor that performs both a magnetic sensing

function along two axes in a common plane and a magnetic multivibrator function is connected to a pair of phase sensitive detectors. A frequency doubler is connected to the multivibrator to sense the frequency of the multivibrator and to double that frequency. The output from the frequency doubler is connnected to the phase detectors. The phase detectors sense an imbalance in the sense windings of the toroidal core at the second harmonic of the multivibrator frequency. The phase detectors generate DC output signals having a magnitude related to the magnitude of the magnetic field causing the imbalance and a polarity determined by the direction of the magnetic field.

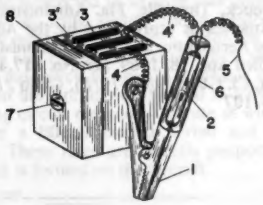


3,571,701

APPARATUS HAVING AUDIBLE AND VISUAL INDICATOR MEANS FOR DETECTION OF LEAKAGE CURRENTS AND INCLUDING CROCODILE CLIP AND MAGNETIC SURFACE ATTACHMENT MEANS

Tin-Hwai Lai, 46, Kuang Jih Rd. Wu Jih, Taichung, China /Taiwan

Filed Dec. 18, 1967, Ser. No. 691,274
Int. Cl. G01r *31/02*
U.S. Cl. 324—51 **2 Claims**



Apparatus for the detection of leadage currents consisting of a housing containing a buzzer for audible indication and having a magnetic surface for attachment to ferrous metal, the housing also having a clip which serves as an alternative attachment means, a gas discharge lamp for visual indication being provided connected in parallel with the buzzer, and an earth wire connecting with one side of the buzzer, the other side being connected to the housing which is conductive.

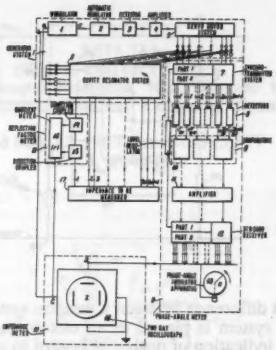
3,571,702

APPARATUS FOR THE WIDE-BAND IMPEDANCE MEASUREMENT OF MICRO-WAVE CIRCUITS IN MICRO-WAVE MULTIPLE-POLE ARRANGEMENTS

Laszlo Hartner, Budapest, Hungary, assignor to Tavkozlesi Kutato Intezet, Budapest, Hungary

Filed Oct. 30, 1967, Ser. No. 678,938
Int. Cl. G01n *27/04*
U.S. Cl. 324—58 **1 Claim**

A process for the wideband measurement of the impedance of microwave current circuits in microwave multiple pole arrangements, i.e., N ports. Into at least one cavity resonator comprised by the N port to be measured a signal is introduced which is so reflected by adjustable reference planes that, in the event of resonance, the signal reflected via the N-port to be measured from the corresponding reference planes is compared with signals introduced into the individual cavity resonators. In the cavity resonators the geometrical spacings (electrical lengths) existing between any desired reference planes are transmitted in the form of electrical signal differences to the indicator apparatus of a synchro receiver system. By means of the tuning elements of the cavity resonators, which are moved in synchronism with the wobbulators energizing the cavity resonators, there is a flow through the corresponding frequency band such that the signals reflected by the reference planes of the cavity resonators are transformed with the aid of the systems assembled therewith (microwave, low frequency, electromechanical systems). The impedances to be measured are continuously indicated in dependency on the frequency.

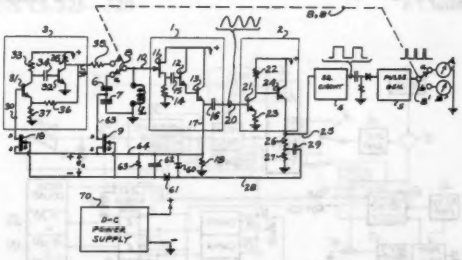


3,571,703

RESONANCE-TYPE INDUCTANCE OR CAPACITANCE METER

Alfred Wallace Russell, 3314 Rubio Crest Drive, Altadena, Calif.

Filed Oct. 11, 1968, Ser. No. 766,845
Int. Cl. G01r *27/00*
U.S. Cl. 324—59 **9 Claims**

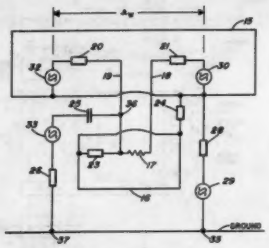


An electronic instrument measures properties of inductors by connecting the unknown inductor in an oscillating feedback loop and measuring the frequency of oscillation by means of a pulse-averaging discriminator. Feedback amplifiers are switched to measure inductance and self-oscillation frequency separately. Readout is by means of analog indicating instruments. A unique control circuit maintains the amplitude of the AC oscillation voltage across the unknown inductor at a constant low value, independently of the inductor's parameters, and permits the use of large shunt capacitors to minimize errors due to the self-capacitance of the inductor.

3,571,704
METHOD FOR DETERMINING THE DEGREE OF HAZARD TO ELECTROEXPLOSIVE DEVICES FROM AN ELECTROMAGNETIC ENVIRONMENT

Roger W. Carson, Fredericksburg, and Helmut A. Schwab, Dahlgren, Va., assignors to the United States of America as represented by the Secretary of the Navy

Filed May 26, 1969, Ser. No. 827,841
Int. Cl. G01r 31/02
U.S. Cl. 324—72 3 Claims

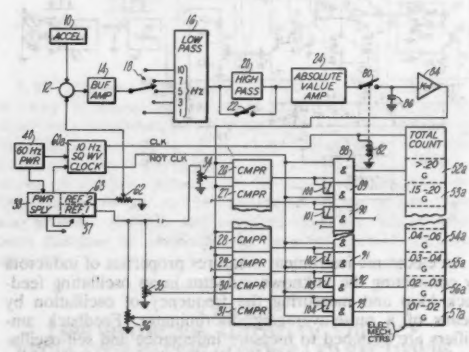


Potential difference between a weapon system and ground when that system is placed in an electromagnetic environment is an indication of degree of hazard to an electroexplosive device carried by the weapon system. The voltage measurement from weapon system to ground was found to be proportionately related to the radio frequency induced currents in the firing circuit of the electroexplosive device within the frequency range of 0—26MHz. Since this induced current can be said to directly indicate hazard of premature detonation to an electroexplosive device, the voltage measurement is an indicator of degree of hazard. By measuring the potential difference of a weapon system against ground in a standard electromagnetic environment and comparing with a measurement made in a working environment, the degree of hazard to the electroexplosive device in the working environment is determined.

3,571,705
ANALOG SIGNAL AMPLITUDE DISTRIBUTION MEASURING APPARATUS

Bruce A. Crane, Wethersfield, and William H. Walter, Granby, Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Dec. 9, 1968, Ser. No. 782,198
Int. Cl. G01r 19/04
U.S. Cl. 324—77 2 Claims

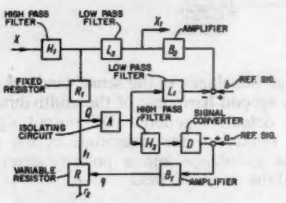


The time distribution of amplitudes of analogue signals, as well as the number of signals in excess of a given amplitude, are recorded in a plurality of electromechanical counters, each one corresponding to a range of amplitudes or a lower limit of amplitude. The amplitudes are determined by periodically comparing the analogue voltage wave form with a plurality of standard voltages, each corresponding to a boundary between the ranges of the various counters. Selectively engageable filtering is provided, and DC offset means is provided (such as for gravity compensation in an accelerometer embodiment).

3,571,706
VOLTAGE MEASURING APPARATUS EMPLOYING FEEDBACK GAIN CONTROL TO OBTAIN A PREDETERMINED OUTPUT AND A FEEDBACK LOOP TO READOUT THE GAIN VALUE

Hakon Bjor, Oslo, Norway, assignor to Sentralinstitutt For Industriell Forskning, Oslo, Norway, Continuation-in-part of Ser. No. 610,928, Jan. 23, 1967, abandoned

Filed July 15, 1969, Ser. No. 841,734
Int. Cl. G01r 17/06, 15/10
U.S. Cl. 324—99 6 Claims

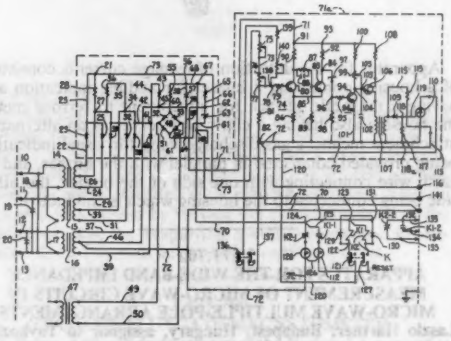


An unknown signal is directly measured by means of an electronic circuit having no mechanical moving parts. The root means square values of unknown AC signals over large ranges are readily determined by measuring the amplification of a compressor in the circuit with a DC voltage signal separated from the measured signal by means of simple filters.

3,571,707
VOLTAGE DROPOUT SENSOR

Walter H. Houck, Titusville, Fla. Administrationthe United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Apr. 18, 1969, Ser. No. 817,482
Int. Cl. G01r 19/00, 19/16; G08b 21/00
U.S. Cl. 324—107 6 Claims

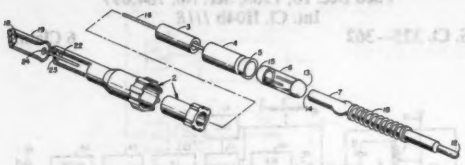


A system for monitoring the output voltage of a power source for generating a signal indicating when the amplitude level of the voltage drops below a predetermined value. The system is provided with a summing circuit so that multiphase voltages can be monitored.

3,571,708
VOLTAGE INDICATOR AND WRITING INSTRUMENT

Bobby L. Hurt, Rte. 3, Concord, Tenn.

Filed Feb. 10, 1969, Ser. No. 797,853
Int. Cl. G01r 19/16
U.S. Cl. 324—133 6 Claims

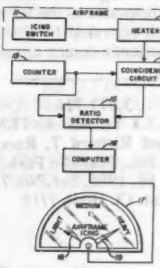


A voltage indicating circuit integrated into a retractable-tip writing instrument.

3,571,709
DETECTOR FOR MEASURING ICING RATES OVER A PLURALITY OF PERIODS OF TIME

Robert M. Gaertner, 9315 Queens Lane, Oxen Hill, Md.

Filed May 21, 1969, Ser. No. 826,548
Int. Cl. G01r 7/00; G01n 27/00
U.S. Cl. 324—142 6 Claims

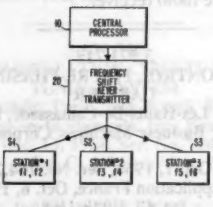


This invention is directed to an icing rate detector. The invention utilizes an icing switch and a heater which are mounted on the outside of an aircraft. When ice forms on the switch, it closes and energizes a heater which then melts the ice and causes the switch to open. The heater thus is cycled on and off when the aircraft is subjected to icing conditions. A rate detecting circuit measures the rate at which power is consumed over a fifteen second period and over a two minute period. These rates are directly proportional to the rate at which ice is formed on the aircraft.

3,571,710
FSK COMMUNICATION SYSTEM UTILIZING CLAMPED DEMODULATOR OUTPUT

Lynn P. West, Raleigh, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 14, 1969, Ser. No. 790,961
Int. Cl. H04l 27/10
U.S. Cl. 325—30 3 Claims

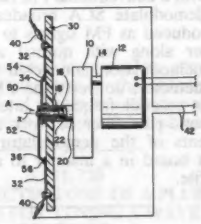


A communication system which transmits binary data by a frequency shift keyer to a plurality of receiving stations while the receiving stations are on a common channel with the transmitter. Each receiving station utilizes an FM demodulator wherein normally the output voltage is directly proportional to the frequency received by the demodulator. In each receiving station, a maximum and a minumum output voltage for the demodulator is established. Between each of these voltage levels, information can be received; whereas, outside the voltage level, there are no transitions but a constant signal output. Thus, by adjusting different level ranges for each receiver, the transmitter can transmit to one desired station without effecting or passing information to the other stations.

3,571,711
SPRING-DRIVEN TIMER

Wilhelm A. Nemetz, Bridgeton, N.J., assignor to Gulf & Western Industrial Products Company, Grand Rapids, Mich.

Filed May 12, 1969, Ser. No. 823,577
Int. Cl. H04b 1/04
U.S. Cl. 325—166 6 Claims

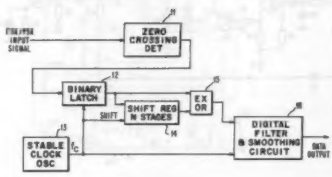


A precision timer for energizing an external load at a preselected point in time, comprising: a spring-driven motor; an electric motor in winding engagement with the spring-driven motor; an electric circuit having contacts; and rotatable contact arms driven by the spring-driven motor for sequential engagement with the contacts.

3,571,712
DIGITAL FSK/PSK DETECTOR

George A. Hellwarth, Deerfield Beach, Fla., and Gardner D. Jones, Jr., Raleigh, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed July 30, 1969, Ser. No. 846,082
Int. Cl. H04b 1/16
U.S. Cl. 325—320 6 Claims



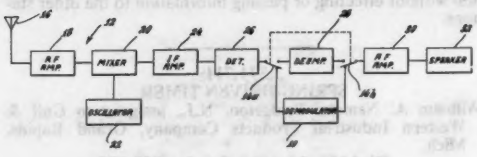
The digital FSK/PSK detector demodulates digital data from a frequency shift keyed modulation signal (FSK) or a phase shift keyed modulation signal (PSK) for moderate data rates including at least 1200 bits per second and is capable of operating over switching networks. The digital FSK/PSK detector comprises a binary amplitude quantizer, a clock, a digital time quantizer, a digital delay coacting with an Exclusive-OR circuit for detecting the digital data signal from the FSK/PSK modulated signal and a digital filter and smoothing circuit for eliminating undesirable noise from the digital data signal.

3,571,713

LOW FREQUENCY WIDE BAND FM DEMODULATORS

James D. Zachary, 49 Hillcrest Ave, Stamford, Conn.

Filed May 27, 1968, Ser. No. 732,463
Int. Cl. H04b 1/28
U.S. Cl. 325—349 10 Claims



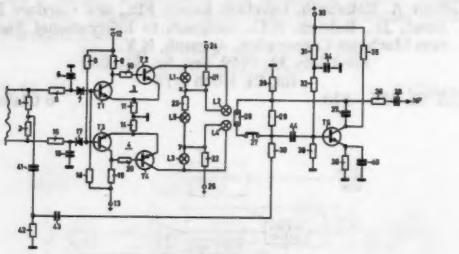
The disclosure concerns a demodulator for demodulating frequency modulated subcarriers. The demodulator is used in combination with a conventional FM receiver detector and is designed to demodulate SCA broadcasts. The SCA intelligence is introduced as FM signals to the modulator of an FM transmitter along with normal audiofrequency intelligence. The demodulator, connected to the output of the FM receiver detector, converts the FM intelligence of the SCA broadcast to audiofrequency intelligence using a two-stage active band-pass filter network and a ratio detector. The components of the demodulator are mounted on a printed circuit board in a manner to achieve compact size and a low profile.

3,571,714

LAMP ARRANGEMENT FOR COMBINED TUNING INDICATION AND SILENT TUNING IN HIGH-FREQUENCY RECEIVERS

Karl Traub, Fuerth, Germany, assignor to Grundig E.M.V. Elektro-Mechanische Versuchsanstatt, inh. Max Grundig, Fuerth, (Bayern), Germany

Filed Sept. 12, 1968, Ser. No. 759,369
Int. Cl. H04b 1/00; H03f 17/00; H03i 1/04
U.S. Cl. 325—364 10 Claims



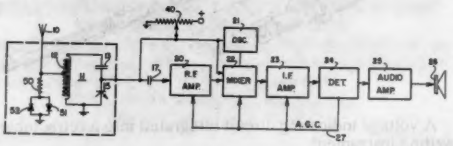
Three sets of lamps are used for indicating the tuning conditions by being interconnected at the outputs of two threshold switching circuits. The inputs to the threshold circuits are, in turn, connected to DC voltages of opposite polarity provided by a symmetrical ratio detector or discriminator. Each threshold circuit has a complementary transistor, and the output of the circuit has a pair of lamps connected in parallel, as the output impedance of the circuit. A third single lamp is connected between the two sets of parallel-connected lamps. When the single lamp is turned on the parallel-connected lamps are turned off and vice versa. An indicator board with three viewing areas is associated with the lamps.

3,571,715

OVERLOAD COMPENSATION FOR ANTENNA-TUNING SYSTEM

Gene Beary, Franklin Park; Anthony T. Heagney, Elmwood Park, and Ole K. Nilssen, Bensenville, Ill., assignors to Motorola, Inc., Franklin Park, Ill.

Filed Dec. 16, 1968, Ser. No. 784,097
Int. Cl. H04b 1/18
U.S. Cl. 325—362 6 Claims



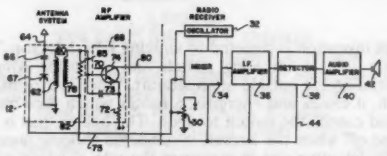
A tank circuit for tuning the antenna of a radio receiver includes a voltage variable diode capacitor as the variable tuning element therein. In order to prevent strong RF input signals from appearing across and being rectified by the voltage variable capacitor, an attenuating circuit in the form of a shunt resistor or a capacitive voltage divider is connected across the antenna input to the tank circuit whenever the level of the RF signal exceeds a predetermined amount. This connection of the attenuating circuit across the antenna may be effected directly in response to the RF signal level itself or in response to a switch operated by the AGC signal of the receiver of which the antenna-tuning circuit is a part.

3,571,716

ELECTRONICALLY TUNED ANTENNA SYSTEM

Fred P. Hill, Elgin, and Richard T. Race, Chicago, Ill., assignors to Motorola, Inc., Franklin Park, Ill.

Filed Apr. 16, 1968, Ser. No. 721,716
Int. Cl. H04b 1/18
U.S. Cl. 325—383 4 Claims



A tank circuit for the aerial of a radio receiver includes a transformer located in a housing positioned at the bottom of the aerial with the primary winding electrically connected to the aerial. A voltage variable capacitor is connected across the primary winding. The secondary winding of the transformer is connected by a coaxial cable to the radio receiver which is remotely positioned from the aerial. A direct current potential from a potentiometer in the radio receiver is coupled through the coaxial cable to the voltage variable capacitor for tuning the antenna tank circuit over a predetermined frequency band. The selected RF signal in turn is coupled from the secondary winding of the transformer through the coaxial cable to the radio receiver.

3,571,717

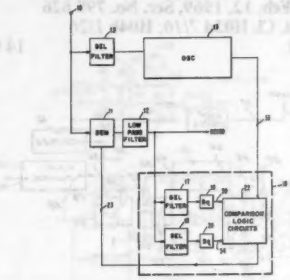
DUAL PILOT CONTROL FOR RE-PHASING A SIGNAL CARRIER

Jean L. Monrolin, Les-Hauts-De-Camassade, France, assignor to International Business Machines Corporation, Armonk, N.Y.

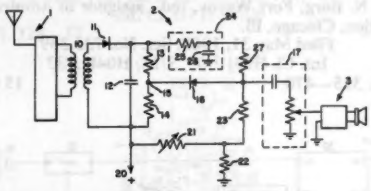
Filed Oct. 1, 1968, Ser. No. 764,253
Claims priority, application France, Oct. 6, 1967, 8733(AM)
Int. Cl. H04b 1/68
U.S. Cl. 325—329 3 Claims

In a communication system transmitting both the lower sideband of a modulated signal and the carrier, the phase

shift of the recovered carrier relative to the signal spectrum can be adjusted to improve signal demodulation. Two pilot frequencies, one higher than and one lower than the signal frequencies to be transmitted and having a known phase relationship are mixed with the signal for modulation by the carrier and transmission. In the receiver, the signal is demodulated with a recovered carrier signal and the pilot frequencies are phase compared to determine the magnitude and direction of their relative phase shift. The recovered carrier signal is then phase shifted to reduce the relative phase shift of the pilot frequencies to within a limited range.



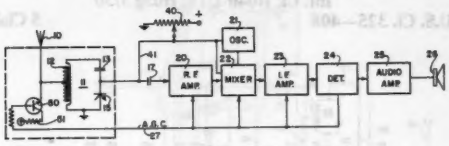
3,571,718
SQUELCH CIRCUIT
Joseph A. Worcester, Frankfort, N.Y., assignor to General Electric Company
Filed Feb. 29, 1968, Ser. No. 709,307
Int. Cl. H04b *1/10*
U.S. Cl. 325—478 **6 Claims**



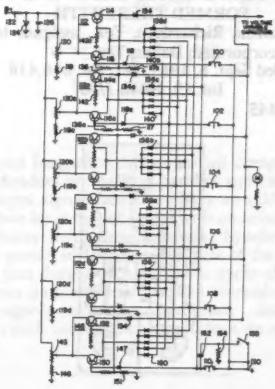
A radio receiver including a squelch circuit having a unilateral conducting element normally biased for nonconduction connected between the detector and audio amplifier stages. An integrating circuit is connected between the detector output and an output terminal of the unilateral conducting element. Upon appearance of a detected audio signal at the detector output, the integrating circuit develops a biasing potential at the output terminal of the element. When the magnitude of the bias produced by the integrating circuit exceeds the level necessary to maintain the unilateral conducting element in a nonconducting state, the element conducts, and the audio signal is coupled to the audio amplifier input.

3,571,719
OVERLOAD COMPENSATION CIRCUIT FOR ANTENNA TUNING SYSTEM
Gene Beary, Franklin Park, and Kamil Y. Jabbar, River Grove, Ill., assignors to Motorola, Inc., Franklin Park, Ill.
Filed Dec. 13, 1968, Ser. No. 784,046
Int. Cl. H04b *1/18*
U.S. Cl. 325—383 **6 Claims**

In an antenna tuning system using a voltage variable capacitor diode in the tank circuit for tuning, the antenna is provided with an overload compensation circuit for the capacitor diode in the form of a variable shunt impedance connected between the antenna and ground. The variable impedance is in the form of a transistor or a field effect transistor, the conduction of which is controlled by the AGC voltage in the radio receiver supplied with signals from the antenna tuning circuit. As the AGC signal increases, the impedance of the transistor decreases to shunt increasing amounts of the signal supplied by the antenna to ground. This limits the signal level across the voltage variable capacitor to prevent rectification of high level signals thereby.



3,571,720
SYSTEM FOR SELECTING ONE OF A PLURALITY OF CONTROL UNITS FOR TUNING A WAVE SIGNAL RECEIVER
Anthony T. Heagney, Elmwood Park, Ill., assignor to Motorola, Inc., Franklin Park, Ill.
Filed July 10, 1968, Ser. No. 743,729
Int. Cl. H04b *1/06, 1/16, 1/32*
U.S. Cl. 325—390 **10 Claims**

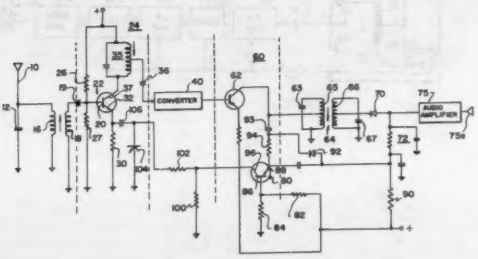


A system for establishing priority in one of a plurality of remote control units used for tuning a radio by varying the bias on voltage variable capacitors in the antenna, RF and local oscillator stages. Each remote control unit includes a semiconductor switching circuit connected between a momentary pushbutton switch and a potentiometer calibrated to the radiofrequency band. Actuating the pushbutton switch of one unit energizes the switching circuit of that unit to couple a potential through the potentiometer to the control unit. The pushbutton also connects a potential to the switching circuits of the remaining control units to deenergize them.

3,571,721
AGC WITH VARIABLE CAPACITY TO BYPASS RF STAGE DEGENERATIVE FEEDBACK

Kamil Y. Jabbar, River Grove, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed May 1, 1968, Ser. No. 725,856
Int. Cl. H04b 1/16; H03g 3/30
U.S. Cl. 325—408 5 Claims

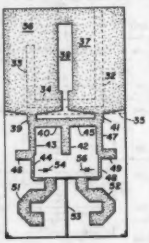


A voltage variable capacitor is coupled across a degenerative feedback resistor which is connected to the common electrode of a transistor forming the radio frequency amplifier stage of a radio receiver. A rectifier circuit connected to the intermediate frequency stage of the receiver rectifies the modulated signal and provides an automatic gain control voltage that is coupled by an amplifier to a voltage variable capacitor to vary the reactance in accordance with the level of the modulated signal. A portion of the degenerative feedback signal is bypassed by the variable capacitor proportional to the direct current bias applied thereto to control the gain of the radio amplifier stage.

3,571,722
STRIP LINE COMPENSATED BALUN AND CIRCUITS FORMED THEREWITH

George D. Vendelin, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sept. 8, 1967, Ser. No. 666,418
Int. Cl. H04b 1/26
U.S. Cl. 325—445 13 Claims

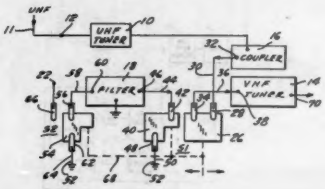


A strip line compensated unbalanced-to-balanced converter having an inherently wide bandwidth for impedance matching or filtering in strip line applications. A two-sided printed circuit board contains the unbalanced input circuit on one side and the balanced output circuit on the opposite side in the area of the strip line circuit. By analogy, the "balun" acts like a push-pull transformer having two output signals 180 electrical degrees out-of-phase from each other. Balun circuits find application as the coupling device for connecting the local oscillator signal to a mixer circuit. Another application of a strip line balun is in a harmonic generator wherein two baluns are used, one at the input and the other at the output.

3,571,723
UHF-VHF TUNER HAVING MEANS FOR REDUCING STRAY COUPLING BETWEEN A FILTER AND THE VHF TUNER DURING UHF BAND RECEPTION

Hironobu Ogusu, Tokyo, Japan, assignor to Alps Electric Company, Limited, Tokyo, Japan

Filed Feb. 12, 1969, Ser. No. 798,626
Int. Cl. H03d 7/16; H04b 1/26
U.S. Cl. 325—461 14 Claims

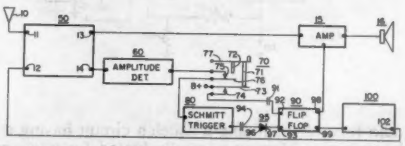


A communications receiver having the capability of receiving signals in the UHF and VHF bands comprises a UHF tuner, a VHF tuner and a filter connected between the VHF antenna port and the VHF tuner during VHF reception. For UHF reception the UHF tuner is operatively connected to the input of the VHF tuner and the output of the filter is disconnected therefrom. A switch is provided to do one or more of the following during UHF reception: (a) disconnect the input of the filter from the VHF antenna port; (b) connect the filter input to ground; and (c) connect the output of the filter to ground, all to reduce the stray coupling of spurious signals from the VHF antenna to the VHF tuner during UHF reception.

3,571,724
ELECTRICALLY TUNABLE SIGNAL SEEKING TUNER

Arthur N. Borg, Fort Wayne, Ind., assignor to Admiral Corporation, Chicago, Ill.

Filed May 31, 1968, Ser. No. 733,339
Int. Cl. H03j 3/00, 3/18; H04b 1/32
U.S. Cl. 325—470 15 Claims



An all-electronic signal seeking receiver in which a binary counter and a transistorized resistor matrix is utilized to produce an incremental step voltage for reverse biasing a varactor diode included in the tunable circuit of the receiver. The binary counter is started by a flip-flop being driven to its "set" position. Upon receipt of a proper signal, a detector drives the flip-flop to its reset position which stops the binary counter. The transistorized resistor matrix, however, maintains its output voltage at the particular level corresponding to receipt of the signal to maintain the receiver in tune.

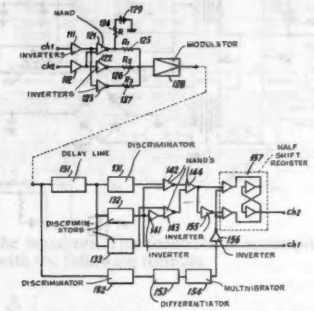
3,571,725
MULTILEVEL SIGNAL TRANSMISSION SYSTEM

Hisashi Kaneko, and Tatsuo Ishiguro, Tokyo, Japan, assignors to Nippon Electric Company, Limited, Shiba Gochome Minato-ku, Tokyo, Japan

Filed May 22, 1968, Ser. No. 731,197
Claims priority, application Japan, May 25, 1967, 42/33798
Int. Cl. H03k 5/00
U.S. Cl. 328—14 5 Claims

A transmission system is described for transmitting a plurality of two-level pulse trains of arbitrary synchronization

over a common signal path. A pair of pulse trains of varying pulse lengths are applied to a digital network which produces a binary equivalent of the condition of the input pulse trains at any time. The binary count from one pulse train occupies a different order, by a multiple of two, from that of the other pulse train. An analogue equivalent of the binary output is



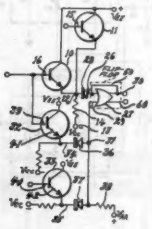
generated to provide a composite signal. After suitable modulation and demodulation, the original pulse trains are reconstructed by passing the composite waveform through several amplitude discriminators which with further digital circuitry accurately reconstruct the waveforms. General approaches are disclosed.

3,571,726

HIGH SPEED DOUBLE RANK SHIFT RIGISTER

Elmer L. Henderson, Philadelphia, Pa., assignor to the United States of America as represented by the Secretary of the Air Force

Filed Feb. 12, 1968, Ser. No. 704,740
Int. Cl. G11c *19/00*
U.S. Cl. 328—37 **8 Claims**



A double rank shift register having a coupling stage on the input side periodically pulsed by a control signal to enable or inhibit the first register element to accept input data. The control signal to the coupling stage of the second register element is 180° out of phase with control signal to the first register element to enable or inhibit the second register element. Since the coupling stages used between the register elements are identical, the phase of the control signal determines whether the coupling stage is enabled or inhibited.

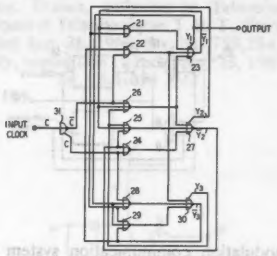
3,571,727

ASYNCHRONOUS SEQUENTIAL DIVIDE BY THREE LOGIC CIRCUIT

John A. Lombardi, Bradford, Mass., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 12, 1968, Ser. No. 783,348
Int. Cl. H03k *21/00*
U.S. Cl. 328—41 **9 Claims**

The particular state assignments used result in a two-level realization that can be economically implemented with integrated logic gates. With successive level changes of the input clock signal the circuit produces a succession of states of the internal state variable which are fed back to control, along with the clock, these internal variables. Each variable



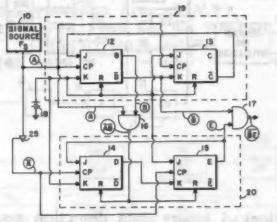
has a period three times the period of the clock and may be monitored as the output but the duty cycle and phase of each differ.

3,571,728

FRACTIONAL FREQUENCY DIVIDER

John J. Andrea, Marion, and Charles M. Dennison, Hiawatha, Iowa, assignors to Collins Radio Company, Cedar Rapids, Iowa

Filed June 19, 1969, Ser. No. 834,723
Int. Cl. H03k *21/00*
U.S. Cl. 328—41 **4 Claims**



A fractional frequency divider circuit comprising a pair of frequency dividers arranged in parallel and each of which divides the input signal frequency F_s y an odd integer N to produce a two level output signal with an unbalanced ratio of upper to lower level time intervals. Synchronizing means control the phases of the output signals of the two frequency dividers so that during each complete cycle of output signals there are two time intervals wherein coincidence of level of the two signals occurs. Appropriate detecting means responds to such coincidence to produce an output signal of $2F_sN$.

3,571,729

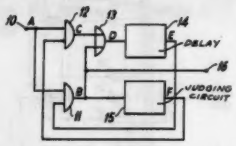
PREDICTIVE GATE CIRCUIT FOR THE RECEPTION OF A PULSE-POSITION-MODULATED PULSE TRAIN

Takamichi Honma, Tokyo, Japan, assignor to Nippon Electric Company, Limited, Minato-Ku, Tokyo, Japan

Filed July 10, 1968, Ser. No. 743,779
Claims priority, application Japan, July 12, 1967, 42/44853
Int. Cl. H03k *5/20*
U.S. Cl. 328—109 **8 Claims**

A predictive gate circuit is described for screening out random error pulses occuring in a communication system utilizing pulse position modulated pulse trains. A gate is in synchronization with the incoming pulses opened at a known time corresponding to the basic interval rate of the pulse train and is held open for a duration corresponding to the position modulation range used in the pulse train. A judging

circuit is employed which determines when the predictive gate is to be reset for resynchronization with the pulse train when synch is lost due to random error pulses. Several embodiments are shown with one adapted for use with a pulse



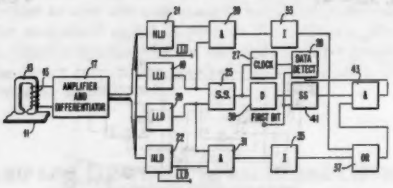
position modulation communication system wherein pulse positions representative of zero modulation are suppressed at the transmitter end and regenerated in the disclosed predictive circuit.

3,571,730

SELF-CLOCKED BINARY DATA DETECTION SYSTEM WITH NOISE REJECTION

George T. Webb, Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed July 15, 1968, Ser. No. 744,753
Int. Cl. H03k *5/20*
U.S. Cl. 328—117 **5 Claims**



A self-clocked binary data detection system employing multiple threshold level detection of the differentiated read-back signal. A first threshold level detector detects the zero crossovers of the differentiated read-back signal which correspond to the peaks of the read-back signal to provide the self-clocking and data information. A second threshold level detector determines when the signal amplitude of the differentiated read-back signal is above a certain threshold level. An error is indicated if the second threshold detector fails to indicate that the signal amplitude has reached the second threshold level within a predetermined time after the first threshold detector provides an output signal. The output signal of the second threshold detector is latched on and is reset by the next subsequent zero crossover detection by the first detector. This enables the predetermined time interval to be relatively large with respect to the period of the wave form, therefor insuring low and high frequency detection compatibility with weak input signals.

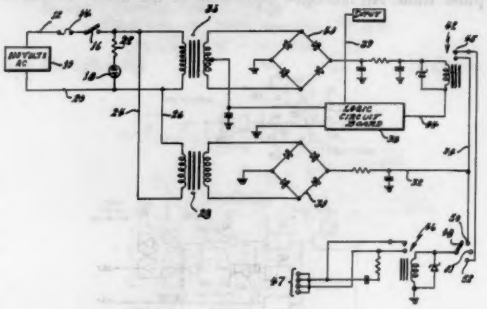
3,571,731

HIGH-SPEED SYNCHRONOUS SAMPLER CONTROL TIMER

Richard E. Rabe, Rte. #3, Rome, and Ronald J. Covello, 2411A Snark St., Griffiss AFB, N.Y.

Filed Feb. 25, 1969, Ser. No. 802,077
Int. Cl. G01r *29/02*; **H03k** *5/00*
U.S. Cl. 328—131 **2 Claims**

A synchronous timer that counts input pulses and operates a connected device when a preselected count is reached. The timer contains voltage control circuitry, a binary logic circuit, a coincident gate and switch for preselecting the number of pulses, a multivibrator connected to the coincident gate, a reset circuit for automatically returning the count to zero after the preselected count is reached and a



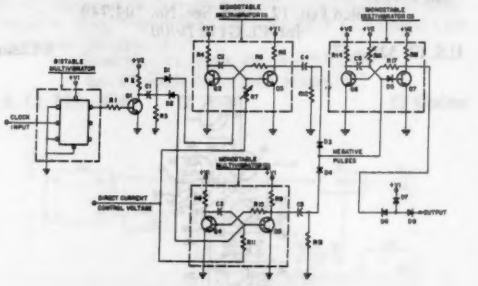
relay circuit connected to the coincident gate to operate the connected device.

3,571,732

VOLTAGE CONTROLLED PHASE SHIFTER

Jack T. Richardson, Seattle, Wash., assignor to the United States of America as represented by the Secretary of the Air Force

Filed July 3, 1968, Ser. No. 742,450
Int. Cl. H03b *3/04*
U.S. Cl. 328—155 **1 Claim**



A circuit to vary the phase of a square wave clock as a function of a DC input voltage by dividing and differentiating the clock input signal to produce positive and negative pulses, gating these pulses to trigger two monostable multivibrators, the pulse widths of which are functions of the DC input voltage. The multivibrator outputs are differentiated, combined, and the frequency is doubled to obtain the phase shifted signal.

3,571,733

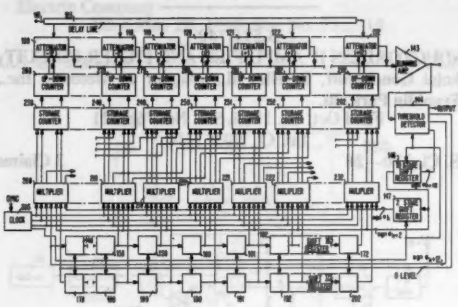
ADAPTIVE DELAY LINE EQUALIZER FOR WAVEFORMS WITH CORRELATION BETWEEN SUBSEQUENT DATA BITS

Yang Fang, Clarksburg, Md., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 13, 1968, Ser. No. 759,644
Int. Cl. H03b *1/00*; **H04b** *1/10*; **H03k** *5/00*
U.S. Cl. 328—162 **5 Claims**

An adaptive delay line equalizer for correcting distortions superimposed upon a digital pulse train wherein there is a correlation between various bits of information. The equalizer automatically adapts itself to changing channel condi-

tions by examining the composite output of the equalizer and feeding back this information simultaneously to at least two



stages of the equalizer. This feedback is accomplished in accordance with the following formula:

$$h_j=\frac{1}{6KA^2}\sum_{k=1}^{K}\left[(\operatorname{sgn} e_k)(\operatorname{sgn} a_{k-j})+\frac{1}{2}(\operatorname{sgn} e_k)(\operatorname{sgn} a_{k+2-j})+\frac{1}{2}(\operatorname{sgn} e_{k+2})(\operatorname{sgn} a_{k-j})\right]$$

3,571,734

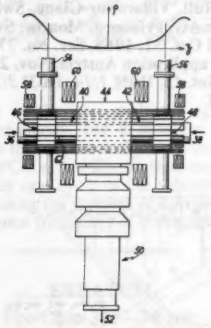
METHOD OF PRODUCTION, ACCELERATION AND INTERACTION OF CHARGED-PARTICLE BEAMS AND DEVICE FOR THE EXECUTION OF SAID METHOD

Terenzio Consoli, LaCelle Saint-Cloud; Rene Bardet, Clamart; Richard Geller, Antony, and Bernard Jacquot, Massy, France, assignors to Commissariat AL Energie Atomique, Paris, France

Continuation of application Ser. No. 621,946, Apr. 9, 1969, now abandoned. This application Nov. 21, 1969, Ser. No. 872,455

Int. Cl. G21b *1/22*; H01j *1/50*; H05h *1/02*

U.S. Cl. 328—233 **13 Claims**



A method of accelerating particles of a nonionized or preionized ionizable gas parallel to an axis which consists in applying to said gas at least one high-frequency electromagnetic field having a frequency greater than 10^9 /s, a so-called axial magnetic field having symmetry of revolution, a so-called radial magnetic field, said high frequency of the electromagnetic field being determined as a function of the amplitude of the axial magnetic field so that said electromagnetic field should yield energy to the ionized gas by cyclotron resonance, the ionized gas being then directed into a discharge space after having been subjected to the high-frequency field, and a device for the application of said method.

3,571,735

DETECTION CIRCUIT INCLUDING COMPENSATION FOR THE THRESHOLD OF THE FORWARD CHARACTERISTIC OF A SEMICONDUCTOR JUNCTION

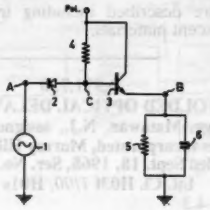
Jean Martial Ducamus, Paris, France, and Jacques Andrieu, Chevilly-larue, France, assignors to Telecommunications Radioelectriques et Telephoniques T. R. T., Paris, France

Filed Aug. 26, 1968, Ser. No. 755,294

Claims priority, application France, Aug. 25, 1967, 119,027

Int. Cl. H03d *1/18*

U.S. Cl. 329—101 **5 Claims**



A transistor detector circuit features a diode coupled in series with the base of the transistor to temperature compensate the circuit against temperature shifts in the base-emitter threshold voltage. A second transistor and a second diode can also be used for detecting signals of greater amplitude.

3,571,736

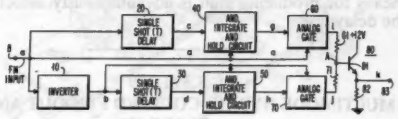
DEMODULATOR FOR PULSE WIDTH MODULATED SIGNALS

Lynn P. West, Raleigh, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 14, 1969, Ser. No. 790,950

Int. Cl. H03k *9/08*

U.S. Cl. 329—104 **5 Claims**



The subject disclosure relates to a frequency demodulator. The demodulator produces two pulse trains from the transitions which are square wave trains with one train being inverted with respect to the other. These transitions define "-transition periods." During the first transition period, a capacitor is discharged so that at the end of that period, it provides a signal that is a function of the time width of the first odd transition period of the first train of square waves. During the second even transition period, another capacitor is discharged so that at the end of this period the capacitor provides a signal which is a function of the time length of the second transition period. Thus, the two trains provide alternately a voltage level that is a function of alternate transition periods. These signals are then added to produce a quantitized version of the frequency modulation.

3,571,737

TRANSMISSION LINE

Stewart E. Miller, Middletown Township, Monmouth County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

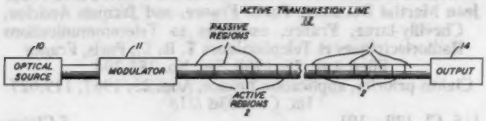
Filed June 7, 1968, Ser. No. 735,445

Int. Cl. H01s *3/05*, *3/09*

U.S. Cl. 330—4.3 **9 Claims**

Losses inherent in a dielectric optical transmission line are overcome by including regions of active laser material along

the line which, when suitably excited, function as laser amplifiers for the guided wave energy. A variety of pumping arrangements are described including injection diodes and electroluminescent materials.

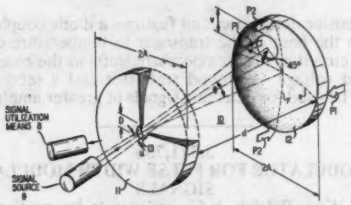


3,571,738

FOLDED OPTICAL DELAY LINE

Detlef C. Gloge, Matawan, N.J., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed Sept. 18, 1968, Ser. No. 760,410
Int. Cl. H03f 1/00; H01s 3/00
U.S. Cl. 330—4.3 **3 Claims**



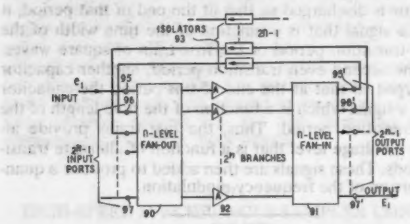
By operating a folded (cavity) delay line in a mismatched mode, it is found that the delay time can be increased by decreasing the distance between the cavity mirrors. The cavity parameters are given for optimum delay. To compensate for the mirror losses produced by each reflection, some means for producing gain is advantageously associated with the delay line.

3,571,739

MULTIMODE HYBRID-COUPLED FAN-OUT AND FAN-IN ARRAY

Harold Seidel, Warren Township, Somerset County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 18, 1968, Ser. No. 768,708
Int. Cl. H03f 7/04, 3/68
U.S. Cl. 330—4.5 **13 Claims**



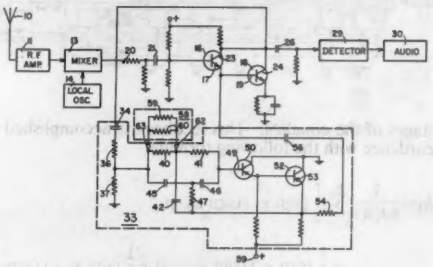
In a typical hybrid-coupled fan-out, fan-in array, one port of each hybrid junction is resistively terminated and the array is restricted to one mode of operation. By removing some or all of these terminations and utilizing the previously unavailable ports, the array can be operated in additional modes. Various arrangements are disclosed for simultaneously handling a plurality of different signals; for utilizing the array in a self-cascaded manner; and for operating in a manner which combines features of both arrangements.

3,571,740

INDUCTORLESS IF AMPLIFIER AND FILTER CIRCUIT

Nikolai Goncharoff, Roselle, Ill., assignor to Motorola Inc., Franklin Park, Ill.

Filed Oct. 16, 1968, Ser. No. 768,121
Int. Cl. H03f 1/34
U.S. Cl. 330—28 **3 Claims**



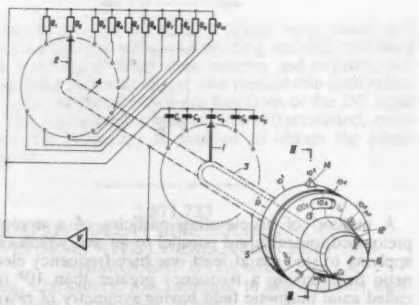
An IF amplifier circuit for a radio receiver includes a tuned feedback circuit to provide the desired frequency response for the IF amplifier. The tuned feedback circuit includes a twin T filter and is connected to the input and output of the IF amplifier through isolation networks. No inductors are required in this circuit so that it can be manufactured in an integrated circuit form. Provision is made for the connection of external resistors to the twin T filter in order to tune the integrated circuit to give the proper IF frequency response.

3,571,741

ELECTRIC AMPLIFIER

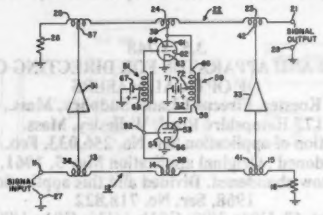
Jurge Leo Von Ruti, Villars-sur-Glane, Switzerland, assignor to Vibro-Meter AG, Fribourg, Moncoe, Switzerland

Filed Oct. 31, 1968, Ser. No. 772,193
Claims priority, application Austria, Nov. 2, 1967, A9865/67
Int. Cl. H05f 1/14; H03f 3/52
U.S. Cl. 330—51 **5 Claims**



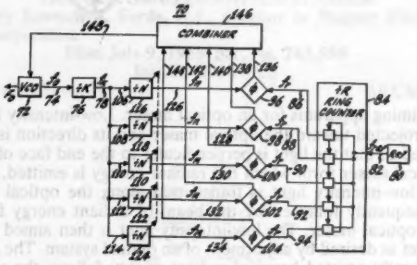
Electric amplifier, particularly for piezoelectric transducers, having a feedback of a plurality of capacitances and resistances coupled in parallel with the capacitances, both the capacitances and the resistances being graduated each in a progression and selectively engageable by means of switches.

3,571,742
PUSH-PULL DISTRIBUTED AMPLIFIER
Robert D. Wengenroth, Liverpool, N.Y., assignor to General Electric Company
Filed May 28, 1968, Ser. No. 732,719
Int. Cl. H03f *3/60*
U.S. Cl. 330—54 **5 Claims**



A broadband, push-pull distributed amplifier is disclosed, the amplifier stages being individually connected for push-pull operation. The amplifier is capable of Class B or AB operation with high efficiency and low distortion.

3,571,743
PHASE LOCK LOOP
Elchanan Dove Menkes, Westmont, N.J., assignor to RCA Corporation
Filed Oct. 30, 1968, Ser. No. 771,884
Int. Cl. H03b *3/06*
U.S. Cl. 331—11 **14 Claims**



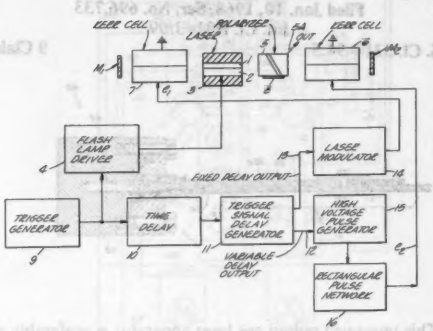
In a frequency synthesizer, multiple signals having the same reference frequency, but a different phase, are provided. Each one of the reference signals is used to correct the frequency of the VCO at a different time during the time interval necessary for one cycle of the reference signal to occur, thereby increasing the number of corrections without increasing the reference frequency of correction.

ERRATUM

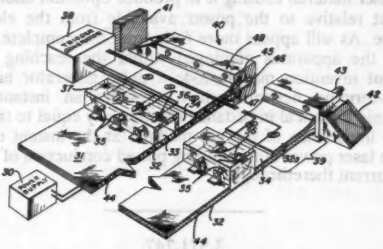
For Class 331—74 see:
Patent No. 3,571,644

3,571,744
LASERS INCORPORATING TIME VARIABLE REFLECTIVITY
William R. Hook, Los Angeles, and Roland H. Dishington, Pacific Palisades, Calif., assignors to TRW Inc., Redando Beach, Calif.
Filed Mar. 23, 1967, Ser. No. 625,549
Int. Cl. H01s *3/00*
U.S. Cl. 331—94.5 **8 Claims**

Lasers in which there is time variable reflectivity of the laser cavity during the lasing process. The time variable reflectivity relates to the variation of the reflectivity in the cavity during the power buildup prior to lasering and during the lasering by varying the voltage at predetermined times to a polarity rotating means within the cavity and which acts to partially or totally effectively remove the reflectivity of one of the substantially 100 percent mirrors at the ends of the cavity.



3,571,745
PULSE-CHARGING COUPLING LASER APPARATUS
Daniel E. Altman; Myer Geller, and Thomas A. DeTemple, San Diego, Calif., assignors to the United States of America as represented by the Secretary of the Navy
Filed Jan. 10, 1968, Ser. No. 696,732
Int. Cl. H01s *3/09, 3/22*
U.S. Cl. 331—94.5 **9 Claims**



An improved laser apparatus is disclosed which employs a pulse-charging coupling connected in circuit between a pulse generator means and an excitation medium which is employed to excite a laser material to a lasing level. The laser disclosed preferably comprises a source of electrical power, a pulse generator which may take the form of a pulse-forming network together with a switch means, and an appropriate form of pulse-charging coupling connected between the pulse generator and the medium which is to be excited to raise the lasing material to a lasing level.

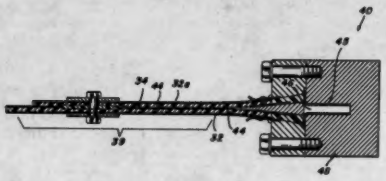
The pulse-charging coupling performs the function of impressing pulsed electrical energy upon a medium such as gas, for example, with significantly improved efficiency to optimize the lasing phenomenon. The concept of the disclosure which teaches the use of a pulse-charging coupling is readily adapted to, and ideally suited for employment in producing the most favorable impedance matching relationships of the laser apparatus which in itself contributes significantly to the efficiency of the transfer of energy from an electrical power source to produce optimized laser power output.

Several forms of pulse-charging couplings are disclosed and described including a flat, parallel plate type which may comprise a dual ground plane and transmission line portion; a multiple conductor coaxial form of pulse-charging coupling is also described and illustrated in the disclosure.

3,571,746
PULSED LASER APPARATUS

Thomas A. DeTemple; Daniel E. Altman, and Myer Geller, San Diego, Calif., assignors to the United States of America as represented by the Secretary of the Navy

Filed Jan. 10, 1968, Ser. No. 696,733
Int. Cl. H01s 3/09
U.S. Cl. 331—94.5 9 Claims



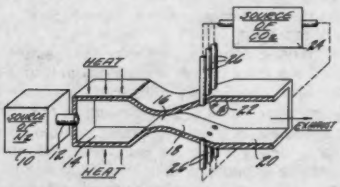
This improved pulsed gas laser apparatus is preferably employed together with a gas laser cell adapted to be excited to a lasing level by the conduction of pulsed electrical current through the gas contained therein. A number of such gas laser cells in different configurations have been devised and are known in the art. The present invention, however, is not limited by the particular configuration of gas laser cell and may be employed advantageously with a variety of different forms and configurations of gas discharge devices.

A source of electrical power, a pulse-forming network, and switch means are connected in circuit to transmit pulsed electrical current flow from the source of electrical power to the gas laser material. A transmission line of the coaxial, flat parallel plate, or other suitable type may be employed as a pulse-forming network; the pulse-forming network, together with switch means, constitutes a pulse generator assembly for developing pulses of electric current which flow through a gas laser material causing it to produce optimum laser power output relative to the power available from the electrical source. As will appear more fully from the complete disclosure, the apparatus employed within the teaching of the present invention may include a pulse generator having a pulse-forming network which presents an instantaneous dynamic electrical impedance substantially equal to the electrical impedance of the gas medium at the instant of maximum laser power output during pulsed conduction of electrical current therethrough.

3,571,747
GAS INJECTION LASER

Barry R. Bronfin; Wayne G. Burwell, Wethersfield; Russell G. Meyerand, Jr., Glastonbury, and Edward N. Hall, Bloomfield, Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Feb. 23, 1968, Ser. No. 710,699
Int. Cl. H01s 3/09
U.S. Cl. 331—94.5 4 Claims

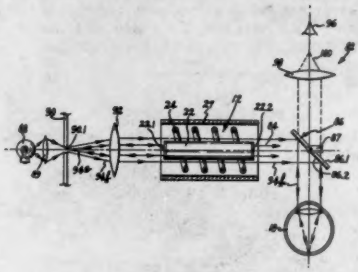


A relatively cool lasing gas such as CO_2 is injected into a gas such as N_2 which is energized sufficiently to raise the energy of the lasing gas to an upper lasing level. The lasing substance injection occurs within an optical cavity which is oriented transversely to the flow of energizing gas, thus insuring maximum utilization of stimulated photon emission which arises from collisions of the lasing substance with the energized gas within the cavity. Energy may be imparted into the energizing gas through the application of heat from an external source. Collisional depopulation of the lower laser level of the lasing gas is optimized by maintaining the lasing area cool, where the mix occurs, such as by expansion of the energizing gas just before it enters the optical cavity.

3,571,748
METHOD AND APPARATUS FOR DIRECTING OUTPUT OF OPTICAL MASERS

Charles J. Koester, Firecrest Lane, Sudbury, Mass., and Elias Snitzer, 177 Hampshire Road, Wellesley, Mass.

Continuation of application Ser. No. 256,033, Feb. 4, 1963, now abandoned, Original application May 5, 1961, Ser. No. 108,020, now abandoned. Divided and this application Apr. 4, 1968, Ser. No. 718,822
Int. Cl. H01s 3/00; G01b 11/26; G01c 1/00
U.S. Cl. 331—94.5 18 Claims

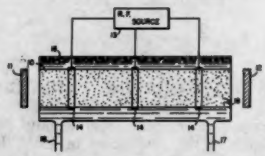


Aiming apparatus for an optical maser. Low-intensity light is projected toward the optical maser and its direction is adjusted so that the light is perpendicular to the end face of the optical maser form which the radiant energy is emitted, i.e., the low-intensity light is transmitted along the optical axis subsequently followed by the beam of radiant energy from the optical maser. The low-intensity light is then aimed at a target as desired by adjustment of an optical system. The subsequently emitted beam of radiant energy follows the same path toward the target. The high-intensity beam of radiant energy is thus properly aimed before firing.

3,571,749
DUST COOLED GAS LASER

Jack A. Soules, Cleveland, Ohio, assignor to the United States of America as represented by the Secretary of the Navy

Filed Nov. 5, 1968, Ser. No. 773,453
Int. Cl. H01s 3/22, 3/09, 3/04
U.S. Cl. 331—94.5 4 Claims

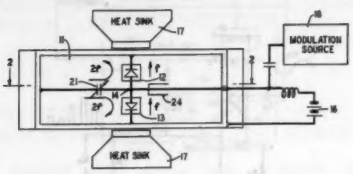


A gas laser in which microscopic particles are circulated within the laser tube in order to cool the laser by conducting the heat to the walls of the laser element.

3,571,750
NEGATIVE RESISTANCE AVALANCHE DIODE OSCILLATOR CIRCUITS

Herbert N. Carlson, Berkeley Heights, and James W. Gewartowski, Chatham, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 1, 1969, Ser. No. 811,950
Int. Cl. H03b *7/14*
U.S. Cl. 331—107 **22 Claims**

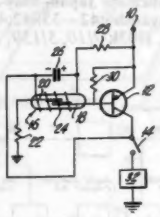


An oscillator circuit comprises a cavity resonator and two avalanche diodes having interconnected anode contacts. The diodes extend across the resonator and a tuning plunger extends toward the diode interconnection. With appropriate diode and circuit parameters, the resonator supports oscillatory modes at frequencies f and $2f$. Energy is derived at frequency f, which is below the inherent resonant frequency of the individual diode packages.

3,571,751
TRANSISTOR-REED SWITCH FLASHER

Harry Kratochvil, Fords, N.J., assignor to Wagner Electric Corporation

Filed July 9, 1968, Ser. No. 743,550
Int. Cl. H03k *3/26*
U.S. Cl. 331—111 **10 Claims**



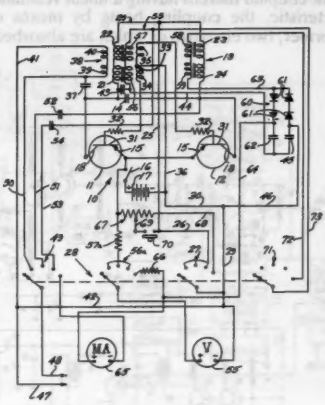
Flashing of a lamp load is effected by a transistor, the emitter and collector of which are connected in series in the load current path. The bias on the base of the transistor is caused to fluctuate by a reed relay, the contacts of which are intermittently opened and closed upon charging and discharging of a capacitor connected in parallel with the reed relay coil.

3,571,752
TRANSFORMER COUPLED MULTI VIBRATOR PULSE GENERATOR FOR FAULT DETECTION

Rudolph J. Sturm, Jr., St. Paul, Minn. (306 E. Sumner St., Northfield, Mass. 55057)

Original application Oct. 8, 1963, Ser. No. 314,727, now Patent No. 3,441,842. Divided and this application Sept. 17, 1968, Ser. No. 760,281
Int. Cl. H03k *3/30*
U.S. Cl. 331—113 **7 Claims**

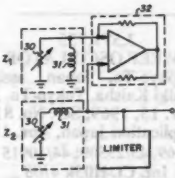
An AC pulse generator for use in line fault detection is constructed as a manually portable transistorized multivibrator for producing a distinctive signal having a pip, which is applied to the circuit under test. Doing so produces unbalanced currents which produce a net magnetic field along the current path, which can then be detected.



3,571,753
PHASE COHERENT AND AMPLITUDE STABLE FREQUENCY SHIFT OSCILLATOR APPARATUS

Teddy G. Saunders, Atherton, Calif., assignor to Moore Associates, Inc., San Carlos, Calif.

Filed Sept. 5, 1969, Ser. No. 855,487
Int. Cl. H03b *7/00*
U.S. Cl. 331—115 **12 Claims**



A phase coherent and amplitude stable frequency shift oscillator apparatus comprising a negative impedance converter, biased into an unstable oscillatory condition, in combination with a pair of impedances respectively coupled to the input terminals thereof for determining the frequency of oscillation. One of the impedances includes a series resistive-reactive impedance circuit and the other includes a parallel resistive-reactive impedance circuit. Means are provided for changing the value of the resistive components of the impedances in order to alter the output frequency of the oscillator apparatus and a level limiting and buffering means is provided for stabilizing the oscillatory operation and buffering the output obtained from the apparatus.

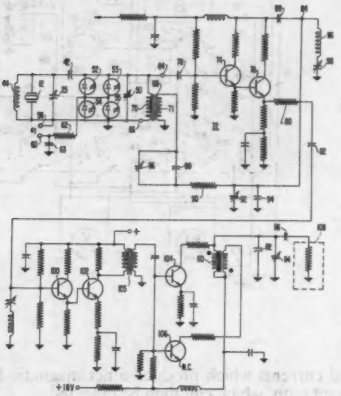
3,571,754
WIDE DEVIATION VOLTAGE CONTROLLED CRYSTAL OSCILLATOR

Daniel J. Healey, III, and Michael M. Driscoll, Baltimore, Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

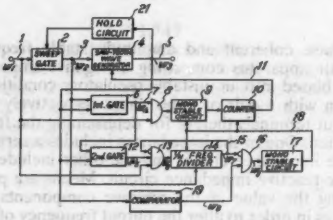
Filed Dec. 24, 1968, Ser. No. 786,609
Int. Cl. H03b *5/36*
U.S. Cl. 331—116 **12 Claims**

A variable frequency harmonic oscillator including a voltage tunable crystal controlled resonator incorporating a quartz crystal unit with precisely antiresonated (neutralized) static capacitance operating substantially at the series reso-

nant frequency of the quartz crystal as opposed to the antiresonant frequency thereof and a voltage variable reactance network coupled thereto having a linear reactance vs. voltage characteristic, the coupling being by means of a reactive transformer, two elements of which are absorbed in combination with elements of the neutralized crystal and variable reactance networks. Additionally a maintaining circuit is coupled to the resonator forming an osciliator thereby and including a circuit providing a means for suppressing spurious oscillations at undesired frequencies below the desired frequency band of operation.

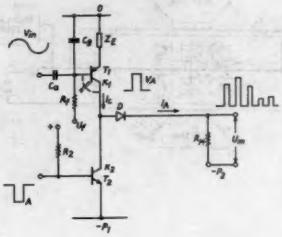


3,571,755
SWEEP OSCILLATOR
Mitsuhiro Ejiri, Tokyo-To, Japan, assignor to Iwasaki Tsushinki Kabreshiki Kaisha, Tokyo-To, Japan
Filed Apr. 15, 1969, Ser. No. 816,250
Claims priority, application Japan, Apr. 18, 1968, Feb. 14, 1969, 43/25500; 44/10915
Int. Cl. H03k *4/08*
U.S. Cl. 331—143 **3 Claims**



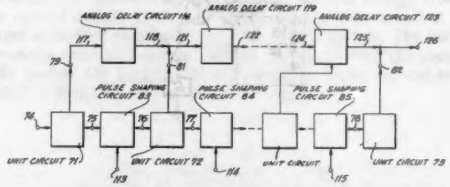
A sweep oscillator used to generate a sawtooth wave that can be amplified to serve for deflecting the electron beam of a cathode-ray tube in synchronism with any of input pulses, where the different slopes of the sawtooth wave are successively switched automatically until any of the input pulses is not received within a predetermined first interval starting in synchronism with the start of the sawtooth wave and, when the number of the input pulses received within a predetermined second interval included within the duration of the sawtooth wave and longer than the first interval is less than the predetermined number, a sawtooth wave having the gentlest slope is generated.

3,571,756
MODULATOR DEVICE
Karl Ivan Lennart Skoog, Farsta; Gunnar Lennart Kjellander, Bollmora, and Britt Ingegard Lunden, Jakobsberg, Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden
Filed May 14, 1968, Ser. No. 729,085
Claims priority, application Sweden, June 1, 1967, 7667/67
Int. Cl. H03k *13/02*
U.S. Cl. 332—9 **2 Claims**



A pulse current modulator utilizes a pair of complementary transistors having interconnected collectors connected via a diode to an output load. The transistors are energized by an operating voltage connected across their emitters. The base of one of the transistors receives the amplitude modulated signal which is to be pulse control modulated while the base of the other transistor receives constant amplitude pulses to provide the pulse times of modulation.

3,571,757
CASCADED CODER FOR A PULSE MODULATION SYSTEM
Zeniti Kiyasu, and Tetsuya Miki, Sendai-shi, Japan, assignors to Fiyitsu Limited, Kawasaki, Japan
Filed May 24, 1968, Ser. No. 731,781
Claims priority, application Japan, May 27, 1967, Aug. 21, 1967, Tokugansho;42—33842;42—53653
Int. Cl. H03k *7/10, 5/159, 13/74*
U.S. Cl. 332—9 **9 Claims**

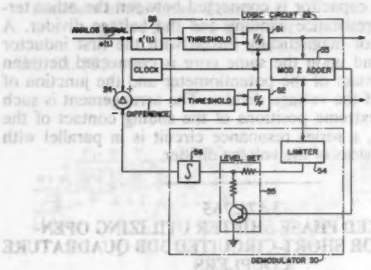


A pulse-shaping circuit is interposed between each adjacent pair of pulse-modulating circuits of a pulse modulation system. Each pulse-shaping circuit comprises a sampling circuit and a storing or holding circuit to prevent a waveform transferred from one pulse-modulating circuit to the next from being adversely affected by the preceding circuit, and to thereby decrease the operating time of the modulating circuits to that of the first modulating circuit and thereby provide high speed coder operation.

3,571,758
METHOD AND APPARATUS FOR ADAPTIVE DELTA MODULATION
Henry F. DeFrancesco, McLean, Va., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed May 12, 1967, Ser. No. 638,149
Int. Cl. H03k *13/22*
U.S. Cl. 332—11 **12 Claims**

Method and apparatus to improve delta modulation wherein the direction of the analogue input signal to be ap-

proximated in digital form for transmission is compared with the difference between the analogue input signal and an integrated copy of the digital approximation to adaptively select the amplitude of the transmitted pulses to better follow high frequency excursions in the analogue input signal.

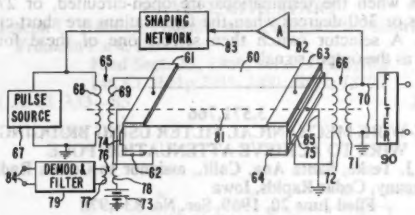


3,571,759

TRANSVERSE NEGATIVE MOBILITY DEVICES

Herbert Kroemer, Menlo Park, Calif.; Alan H. Mac Pherson, New Providence, N.J., and Megha Shyam, Los Altos, Calif., assignors to Fairchild Camera and Instrument Corporation, Syosset, Long Island, N.Y.

Filed Sept. 6, 1968, Ser. No. 757,878
Int. Cl. H03c *3/22*; **H03b** *7/06*
U.S. Cl. 332—16 **10 Claims**



In a properly cut sample of selectively doped semiconductor material, such as germanium, with a selected bias voltage applied along the longitudinal axis, a small transverse voltage applied across one end of the sample produces a transversely polarized domain, which, under the influence of the bias voltage, drifts along the longitudinal axis of the sample. Because the drift velocity is a function of the strength of the bias voltage, and because a pulse injected into the sample can be continuously recirculated at a frequency proportional to the drift velocity, an amplitude modulated signal can be used to vary the bias voltage thereby varying the recirculation frequency of the pulse. As a result, the device can be made to act as either a frequency or a phase modulator.

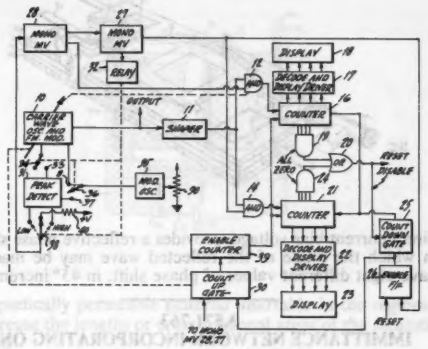
3,571,760

DIRECT READING DISPLAYS FOR INDICATING FREQUENCY SHIFT OF A MODULATABLE CARRIER OSCILLATOR

Edmund I. Schwartz, Fair Lawn, N.J., and Philip Basse, Freeport, N.Y., assignors to Slant Fin Corporation

Filed Sept. 10, 1968, Ser. No. 758,875
Int. Cl. H03c *3/00*; **G01r** *23/10*
U.S. Cl. 332—20 **10 Claims**

A frequency deviation monitor utilizes a reversible or up-down counter for determining the amount of frequency shift of a carrier oscillator signal. A modulating signal is peak detected and thence applied to the carrier oscillator to shift the output frequency. This shifted frequency is used to count down a reversible counter having the unshifted frequency stored therein. The difference between the counts during a predetermined time interval is determinative of the frequency deviation.

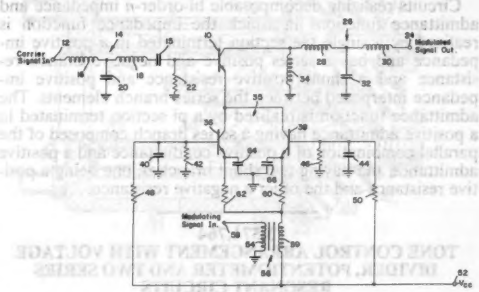


3,571,761

TRANSISTORIZED AMPLITUDE MODULATION CIRCUIT WITH CURRENT CONTROL

Samuel Mason Meek, Long Beach, and Frederick Bluemel, Belmont, Calif., assignors to Hughues Aircraft Company, Culver City, Calif.

Filed May 1, 1969, Ser. No. 820,824
Int. Cl. H03c *1/44*
U.S. Cl. 332—31 **6 Claims**



In the disclosed amplitude modulation circuit an RF carrier signal is applied via a filter to the base electrode of a linearly amplifying transistor, the modulated output signal passing through a filter coupled to the transistor collector electrode. A pair of current control transistors coupled in parallel and connected to the emitter electrode of the amplifying transistor are employed to vary the level of current flow through the amplifying transistor in accordance with an audio frequency modulating signal applied via a transformer between the base and emitter electrodes of each current control transistor.

3,571,762

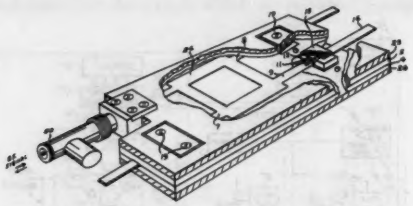
HIGH FREQUENCY DIGITAL DIODE PHASE SHIFTER

Lowell I. Smilen, Great Neck, N.Y., assignor to the United States of America as represented by the Secretary of the Air Force

Filed Oct. 6, 1969, Ser. No. 863,864
Int. Cl. H01p *5/14*
U.S. Cl. 333—10 **4 Claims**

A stripline four-port directional coupler having a common input and output port with the other three ports having

stripline transmission lines terminated respectively in separate diodes, each of which may be switched independently from a conducting to a nonconducting state by a



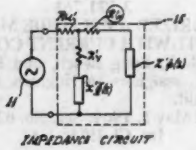
direct current bias voltage, provides a reflective phase shifter in which the phase of the reflected wave may be made to have eight different values of phase shift, in 45° increments.

3,571,763

IMMITTANCE NETWORK INCORPORATING ONE NEGATIVE RESISTANCE

Kurt H. Haase, Watertown, Mass., assignor to the United States of America as represented by the Secretary of the Air Force

Filed Feb. 5, 1968, Ser. No. 702,890
Int. Cl. H03h *5/12, 7/14*
U.S. Cl. 333—24 **6 Claims**



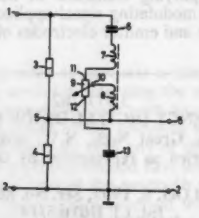
Circuits realizing decomposable bi-order-*n* impedance and admittance functions in which the impedance function is realized by a single tee section terminated in a positive impedance and has a series positive and negative branch resistance and a shunt positive resistance and positive impedance interposed between the series branch elements. The admittance function is realized by a pi section terminated in a positive admittance having a series branch composed of the parallel combination of a positive conductance and a positive admittance and having two shunt branches, one being a positive resistance and the other a negative resistance.

3,571,764

TONE CONTROL ARRANGEMENT WITH VOLTAGE DIVIDER, POTENTIOMETER AND TWO SERIES RESONANT CIRCUITS

Werner Koenigk, Neuhaus, Schloss, Germany, assignor to Grundig Elektro - Mechansiche Versuchsanstalt, Furth Bayern, Germany

Filed Mar. 10, 1969, Ser. No. 805,759
Claims priority, application Germany, Mar. 13, 1968, P 12 90 595.2-31
Int. Cl. H03h *5/00*
U.S. Cl. 333—28 **6 Claims**



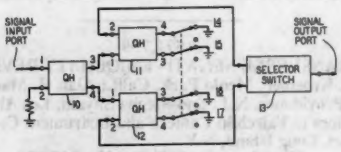
A tone control arrangement in which the input signal is applied to a voltage divider consisting of two resistors connected in series. The junction of the resistors forms the signal output terminal. The series combination of a first capacitor and a first inductor is connected between one terminal of the voltage divider and the resistance winding of the potentiometer. A second capacitor is connected between the other terminal of the resistance winding and the voltage divider. A second inductor magnetically linked with the first inductor by being wound upon the same core is connected between the sliding contact of the potentiometer and the junction of the resistors of the voltage divider. The arrangement is such that in both extreme positions of the sliding contact of the potentiometer, a series resonance circuit is in parallel with one of the resistors of the voltage divider.

3,571,765

QUANTIZED PHASE SHIFTER UTILIZING OPEN-CIRCUITED OR SHORT-CIRCUITED 3DB QUADRATURE COUPLERS

Allen N. Friedman, Fair Lawn, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 15, 1969, Ser. No. 857,909
Int. Cl. H01p *1/10, 1/18, 5/14*
U.S. Cl. 333—31 **3 Claims**



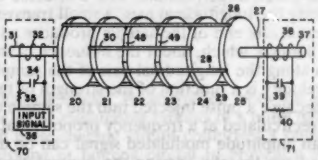
A phase shift selector which utilizes a two-stage binary fan out circuit configuration to establish phase states. The four branches of the fan out are terminated by means of either an open circuit or a short circuit to produce two reflected signals having relative phases of either 90 degrees or 180 degrees when the terminations are open-circuited, or 270 degrees or 360 degrees when the terminations are short-circuited. A selector switch then selects one of these four signals as the output signal.

3,571,766

DISK-WIRE MECHANICAL FILTER USING BRIDGING WIRE TO ACHIEVE ATTENUATION POLE

Roger J. Teske, Santa Ana, Calif., assignor to Collins Radio Company, Cedar Rapids, Iowa

Filed June 20, 1969, Ser. No. 834,978
Int. Cl. H03h *9/26*
U.S. Cl. 333—71 **10 Claims**



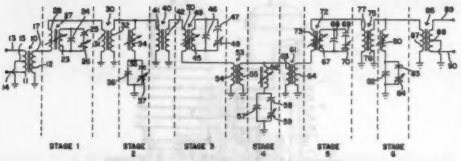
A general stopband disc-wire type mechanical filter having at least four circle mode vibration-type discs therein with a first coupling wire means connected to the perimeters of all four discs and a second coupling wire means connected only to the first and the fourth disc and bridging the two discs therebetween. The second bridging coupling wire means has a length such that it produces a 180° hase shift of energy transferred therethrough with in the passband. Circle mode-type discs resonate in phase with each other at the lower end of the passband and out of phase (with the adjacent discs) at the upper end of the passband. Consequently, the energy transfer through the bridging coupling wires is out of phase with the energy transfer through the first coupling wire means both at the lower and upper ends of the passband, thereby producing the general stopband characteristic.

3,571,767

ELECTRICAL FILTER ARRANGEMENT

Garret Thayer Bush, III, North Cape May, N.J., assignor to the United States of America as represented by the Commandant of the Coast Guard

Filed July 10, 1968, Ser. No. 743,706
Int. Cl. H03h 7/10
U.S. Cl. 333—76 11 Claims



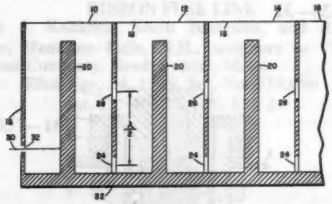
This invention relates to a highly selective electrical filter network composed of passive circuit elements and capable of attenuating or "notching" only selected frequencies from a band while freely passing without substantial attenuation the remaining frequencies in the band. Such a filter network comprises a plurality of series and parallel LC resonant networks or stages alternately disposed in circuit relationship with one another and designed to resonate at the "notching" frequency. The stages are interconnected by means of suitable matching transformers to permit the optimum use of the inherent *Q* of each inductor.

3,571,768

MICROWAVE RESONATOR COUPLING HAVING TWO COUPLING APERTURES SPACED A HALF WAVELENGTH APART

Joseph C. Gundry, Phoenix, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Sept. 25, 1969, Ser. No. 860,982
Int. Cl. H01p 7/06, 1/00; H03b 13/00
U.S. Cl. 333—83 2 Claims



Coupling is increased between microwave resonators by providing a plurality of holes in a common wall thereof, the holes being spaced one-half wavelength of the resonant frequency of the resonator.

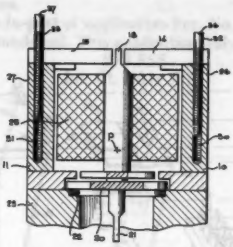
3,571,769

ELECTROMAGNETIC FORCE MOTOR HAVING ADJUSTABLE MAGNETIC SATURATION

John B. Pegram, Los Angeles, Calif., assignor to Bell Aerospace Corporation

Filed May 8, 1969, Ser. No. 822,908
Int. Cl. H01f 7/13
U.S. Cl. 335—230 8 Claims

An improvement in electromagnetic force motors in which the force versus input signal characteristic is adjustable by providing in the flux path regions of magnetically saturable material defining magnetic saturation paths and members of



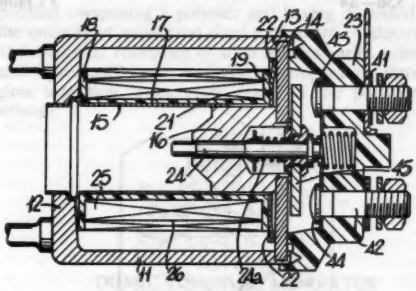
magnetically permeable material insertable in the regions to decrease the lengths or cross-sectional areas of the saturation paths.

3,571,770

IMPROVED SOLENOID HAVING PIN AND SOCKET CONNECTIONS TO THE SOLENOID WINDING

Frank Phillip Dew, Birmingham, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed May 21, 1969, Ser. No. 826,643
Claims priority, application Great Britain, May 27, 1968, 25192
Int. Cl. H01f 7/08
U.S. Cl. 335—256 1 Claim



A solenoid including a housing having a cap which constitutes a closure at one end of the housing, a winding within the housing, and a terminal member on the exterior of the cap, the terminal member being electrically connected to the winding. The terminal member is electrically connected to the winding by way of a conductive pin which is carried by the cap and which extends within the housing, and a conductive socket which is connected to one end of the winding. The pin engages in the conductive socket when the solenoid is assembled, and thereby electrically interconnects the terminal member and one end of the winding.

3,571,771

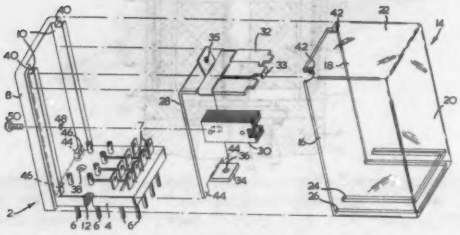
ENCLOSURE FOR PLUG IN RELAY

Edward L. Stephanson, Belleville, Ontario, Canada, assignor to Stegg Electric Limited, Belleville, Ontario, Canada

Filed Mar. 14, 1969, Ser. No. 807,370
Claims priority, application Canada, Feb. 3, 1969, 41,795
Int. Cl. H01f 7/00
U.S. Cl. 335—278 13 Claims

An enclosure for electrical components is provided having an L-shaped base and integral sidewall and a preferably

transparent cover; connecting pins are moulded through the base in a conventional manner and the cover has lips so that it can be slid onto the base in a direction at right angles to the axis of the pins; thus the cover cannot become detached



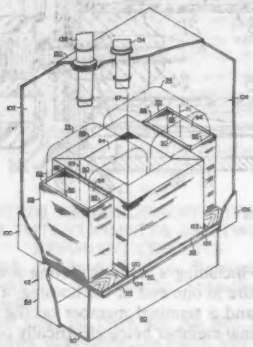
during engagement or extraction of the pins in their socket components, such as relays may be mounted on the integral sidewall; a snap action lock remote from the base indicates closure positively.

3,571,772

ELECTRICAL INDUCTIVE APPARATUS HAVING MAGNETIC SHIELDING LOOPS

Saul Bennon, and William D. Albright, Muncie, Ind., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 18, 1969, Ser. No. 877,649
Int. Cl. H01f 15/04, 27/24
U.S. Cl. 336—84 5 Claims



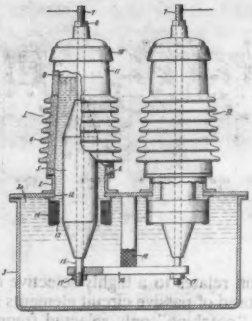
Single-phase electrical inductive apparatus including a magnetic core structure having a main core loop and first and second shielding loops, with the first and second shielding loops being disposed on opposite sides of the main core loop. The main core loop is formed of stacked magnetic laminations having a width dimension *A*, and the first and second shielding loops are formed of stacked magnetic laminations having a width dimension less than *A*/3. Electrical winding means are disposed to encircle the main core loop and first shielding loop, and the main core loop and the second shielding loop. The magnetic core structures and winding means are disposed in a tank having bottom and sidewall portions, with the magnetic core structure being oriented in the tank to magnetically shield the sidewall portions of the tank from the electrical winding means.

3,571,773

CENTER CLAMPED BUSHING TRANSFORMER

Donald J. Johnston, Pittsfield, Mass., assignor to General Electric Company

Filed Nov. 4, 1969, Ser. No. 873,937
Int. Cl. H01f 27/02, 27/28
U.S. Cl. 336—92 5 Claims



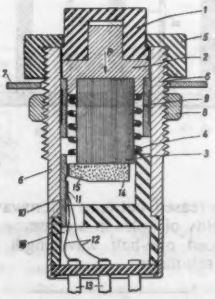
A bushing current transformer is formed by mounting a pair of terminal bushings upon a tank with their axial conducting rods in laterally spaced side-by-side relation and extending into the tank, the proximate internal ends of the rods being bridged by a conductor to form a primary loop. A compression member between the tank wall and the bridging conductor applies a tensile stress to both bushing rods thereby to clamp each bushing assembly in position without the use of insulating sleeves internally of the tank.

3,571,774

NON-CONTACTING ELECTRONIC SWITCH GEAR

Rudolf Hubrich, Ravensburg, Germany, assignor to Raimund Finsterholzl Elektrotechnische Spezialfabrik, Ravensburg, Germany

Filed Apr. 10, 1968, Ser. No. 720,289
Claims priority, application Germany, Apr. 10, 1967, R45,726
Int. Cl. H01c 7/16
U.S. Cl. 338—32 9 Claims



Noncontacting, electronic switch gear particularly for pushbuttons which comprises at least one current carrying field plate connected to starting terminals and forming either a resting contact and/or a working contact, and a permanent magnet having pole shoes. The position of the permanent magnet with respect to the field plate is variable in order to actuate the field plate, by means of a movable part of the switch gear.

3,571,775

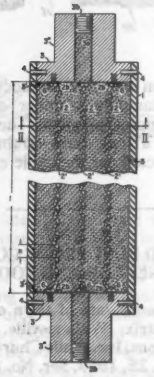
HIGH-VOLTAGE FUSE HAVING A PLURALITY OF HELICALLY WOUND RIBBON FUSE LINKS

Frederick J. Kozacka, South Hampton, and Richard A. Belcher, Hampton Falls, N.H., assignors to The Chase-Shawmut Company, Newburyport, Mass.

Continuation-in-part of application Ser. No. 879,090, Nov. 24, 1969. This application Mar. 3, 1970, Ser. No. 016,116

Int. Cl. H01h *85/08, 85/12*

U.S. Cl. 337—161 24 Claims



A high-voltage fuse having a plurality of helically wound ribbon fuse links forming extension-springlike structures arranged in a cylindrical pattern. The ribbon fuse links are entirely self-supporting, not requiring any support between the ends thereof other than a pulverulent arc-quenching filler.

3,571,776

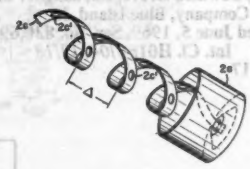
HIGH VOLTAGE FUSE HAVING HELICALLY WOUND RIBBON FUSE LINK

Frederick J. Kozacka, South Hampton, and Richard A. Belcher, Hampton Falls, N.H., assignors to The Chase-Shawmut Company, Newburyport, Mass.

Filed Nov. 24, 1969, Ser. No. 879,090

Int. Cl. H01h *85/08, 85/12*

U.S. Cl. 337—161 7 Claims



A high-voltage fuse having a helically wound ribbon fuse link forming an extension-springlike structure. The ribbon fuse link is entirely self-supporting, not requiring any support between the ends thereof other than a pulverulent arc-quenching filler.

3,571,777

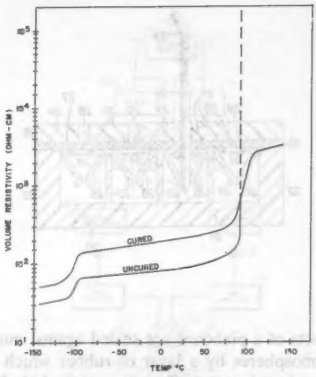
THERMALLY RESPONSIVE CURRENT REGULATING DEVICES

Paul R. Tully, Lowell, Mass., assignor to Cabot Corporation, Boston, Mass.

Continuation-in-part of application Ser. No. 751,382, Aug. 9, 1968, now abandoned. This application July 7, 1969, Ser. No. 839,555

Int. Cl. H01c *7/12*

U.S. Cl. 338—20 8 Claims



The present invention concerns thermally responsive current regulating devices comprising conductive polymeric compositions. Broadly, the devices of the invention comprise electrodes attached to a current controlling polymeric composition comprising a polymer and having dispersed therein the quantity of submicron sized particulate conductive filler. The electrical resistance of such devices varies substantially and reproducibly with variation in temperature through the glass transition temperature range of the polymeric constituent.

ERRATUM

For Class 338—32 see:
Patent No. 3,571,774

3,571,778

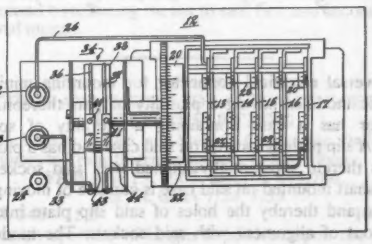
OHMIC STANDARD APPARATUS

John P. Smith, Jr., Elton, Pa., assignor to Vishay Intertechnology, Inc., Malvern, Pa.

Filed July 1, 1968, Ser. No. 741,410

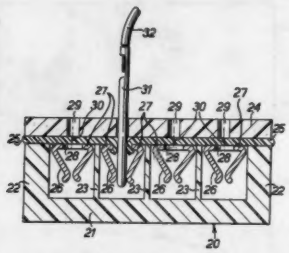
Int. Cl. H01c *1/16*

U.S. Cl. 338—200 6 Claims



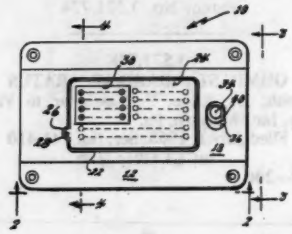
An ohmic standard apparatus having five rocker arm type switches and four resistors associated with each switch. The switches provide a digital readout of the total resistance for resistance settings from 0 to 99,999 ohms. A slide wire type resistor is interconnected with the resistors to provide resistance settings up to 100,000 ohms.

3,571,779
SELF-SEALING PINBOARD
John Covell Collier, Farnworth, England, assignor to AMP Incorporated, Harrisburg, Pa.
Filed Nov. 7, 1968, Ser. No. 774,149
Claims priority, application Great Britain, Nov. 18, 1967, 52543/67
Int. Cl. H01r 7/04, 13/52
U.S. Cl. 339—18 1 Claim



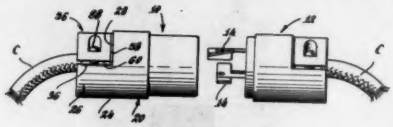
The contacts of a pinboard are sealed against moisture or corrosive atmospheres by a layer of rubber which is punctured when a pin is inserted. The edges of the hole formed in the rubber form a seal around the pin.

3,571,780
UNIVERSAL ELECTRICAL CONNECTOR FOR MINIATURE ELECTRONIC MODULES
Robert A. Boenning, Timonium, and Donald K. Mac Kenzie, Jr., Lutherville, Md., assignors to the United States of America as represented by the Secretary of the Air Force
Filed Aug. 12, 1969, Ser. No. 849,471
Int. Cl. H01r 13/54, 33/44, 33/66
U.S. Cl. 339—36 9 Claims



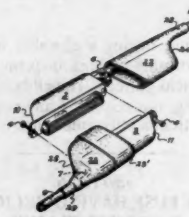
A universal electrical connector for mounting miniature electronic modules having a plurality of pins thereon. The connector has a case containing a plurality of sockets therein. A slip plate is located on said case and has a plurality of holes therein substantially aligned with said sockets. A locking shaft mounted on said case is capable of moving said slip plate and thereby the holes of said slip plate into and slightly out of alignment with said sockets. The module is located within said slip plate and the pins are inserted in said holes and said sockets. Since said holes and said sockets are of a greater diameter than said pins, in one position of the slip plate the pins are in the center of the sockets and out of contact therewith and in another position of the slip plate the pins engage a wall of said sockets in order to make electrical contact therewith.

3,571,781
PLASTIC CABLE CLAMP
Albert J. Gartland, Jr., Trumbull; Vincent F. Lipinski, Stratford, and George A. Riley, Bridgeport, Conn., assignors to Harvey Hubbell, Incorporated, Bridgeport, Conn.
Filed Dec. 6, 1968, Ser. No. 781,846
Int. Cl. H01r 13/56, 13/58
U.S. Cl. 339—105 5 Claims



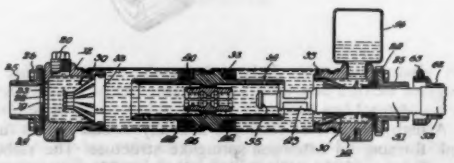
A cable clamp for an electrical connector device including a fixed and rigid clamping member and a flexible and resilient movable clamping member. The movable clamping member is made of a long term strain relieving material which will follow the cable as the cable creeps under the applied load.

3,571,782
MOISTURE AND DUST PROOF COVER FOR AN ELECTRICAL CONNECTOR AND TOOL FOR APPLYING SAME
Lee J. Colbert, Deceased, late of town of Clarence; Dolores B. Colbert, Executrix, Williamsville, N.Y., assignors to Pulse Communications, Inc., Falls Church, Va.
Filed Feb. 25, 1969, Ser. No. 802,762
Int. Cl. H01r 3/02
U.S. Cl. 339—116 3 Claims



A cover for a two part electrical connector including a pair of open ended elastic film sleeves each adapted to be stretch drawn over one of the connector parts, such that when the connector parts are assembled the sleeves may be overlapped to form a moisture and dustproof sealing cover.

3,571,783
CABLE JOINING DEVICE FOR PLASTIC AND ELASTOMERIC INSULATED CABLES
George E. Lusk, Downers Grove, Ill., assignor to G & W Electric Specialty Company, Blue Island, Ill.
Filed June 5, 1969, Ser. No. 830,690
Int. Cl. H01r 3/04, 17/18
U.S. Cl. 339—117 10 Claims



The cable joining device has utility for electrically connecting the prepared ends of two opposed power cables. A

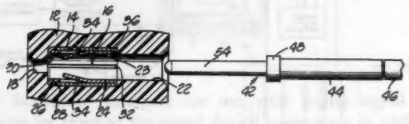
female connector nest formed of metal segments which are expandable is located within a plastic housing open at respective ends. The bare copper end of the cables to be joined are each fitted with a male connector and which are respectively inserted in the connector nest for mechanically and electrically connecting the opposed power cables.

3,571,784

CONTACT ASSEMBLY FOR ELECTRICAL CONNECTOR

Hubert W. Naus, Monrovia; Robert N. Summers, Banning, and Joe J. Sonyi, Yucaipa, Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Feb. 14, 1969, Ser. No. 799,194
Int. Cl. H01r 9/12
U.S. Cl. 339—217 2 Claims



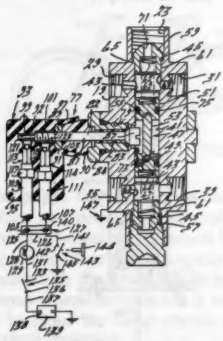
The disclosure relates to a contact assembly formed of a clip mounted in an insulator block. The clip, which is a hollow tube, contains inwardly extending tangs. In order to prevent the insulator plastic material from flowing around and locking the tang during the molding process, and to prevent a rearward force on a terminal member from moving the clip, a sleeve is placed around the clip before it is inserted in the mold. The edge of the forward end of the sleeve abuts the end portion of a lip formed on the forward end of the clip. Upon insertion of a contact terminal into the clip, a collar on the terminal is locked by the tang. Should the terminal be subjected to a rearward force, the force is translated to the sleeve, thus effectively retaining the clip in position.

3,571,785

ELECTRICAL TERMINAL CONNECTION

James A. Kozicki, Warren, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Original application May 2, 1967, Ser. No. 635,518, now Patent No. 3,517,381, dated June 23, 1970. Divided and this application Sept. 29, 1969, Ser. No. 870,886
Int. Cl. H01r 9/08
U.S. Cl. 339—218 5 Claims



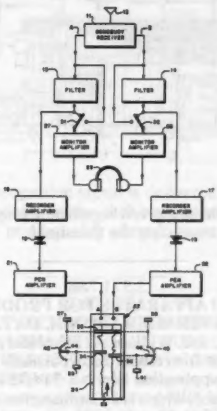
Electrical circuitry for checking the operability of electrical connections and components of an electrical circuit and switch device adapted to energize a warning lamp in event of leakage in one fluid circuit of a two fluid circuit hydraulic brake circuit of a vehicle. Switch includes a housing having a piston movable to close switch in response to a predetermined pressure differential on opposite sides of piston. Electrical checking circuit passes through a molded electrical terminal connected at one end of one of the terminals of switch.

3,571,786

GRAPHIC RECORDING SYSTEM

Donald Mureay Saling, and Edward L. Benson, Poughkeepsie, N.Y., assignors to the United States of America as represented by the Secretary of the Navy

Filed Nov. 29, 1961, Ser. No. 155,867
Int. Cl. G01s 9/66; G01d 9/00
U.S. Cl. 340—2 10 Claims



In a sonobuoy data processing system including a two stylus moving strip chart recorder having the stylus actuating mechanisms thereof coupled to the output circuits of a two channel sonobuoy receiving system, readout and computing apparatus comprising: a first mechanical cursor mounted on said recorder to span said strip chart for sliding movement therealong, second and third mechanical cursors each mounted on said recorder to span a portion of said chart for sliding movement therealong with respect to said first cursor, first and second electromechanical transducing means, means applying energizing voltages proportional to the velocity of sound in water to said transducing means, means mechanically coupling said first transducing means to said first and second cursors whereby said first transducing means provides an output voltage which varies in accordance with the displacement between said first and second cursors, means mechanically coupling said second transducing means to said first and third cursors whereby said second transducing means provides an output voltage which varies in accordance with the displacement between said first and third cursors, first and second output terminal means, and circuit means respectively coupling the output voltages of said first and second transducing means to said first and second output terminal means.

3,571,787

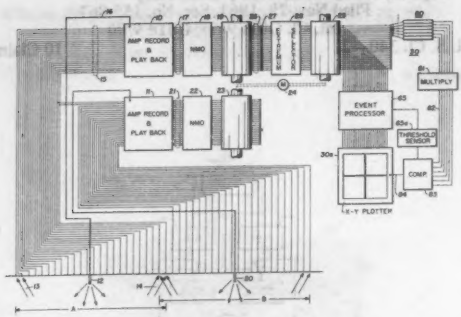
METHOD AND SYSTEM FOR AUTOMATIC SEISMIC REFLECTION PICKING

Milo M. Backus, Dallas, and Stephen C. Merdler, Dallas, Tex., assignors to Texas Instruments Inc., Dallas, Texas

Filed June 13, 1967, Ser. No. 645,766
Int. Cl. G01v 1/28, 1/34
U.S. Cl. 340—15.5 10 Claims

A search aperture of length dependent upon the average period of seismic waves in a time gate of interest is centered at a record time having a predetermined relation with respect to the record time of a peak in a first trace and the peak is sensed for coincidence with a similar peak on an adjacent trace at any point within said time gate. Only upon coincidence preferably between three or more such peaks are the peaks retained as a confirmed seismic event. In a further aspect, a control function is generated which is dependent

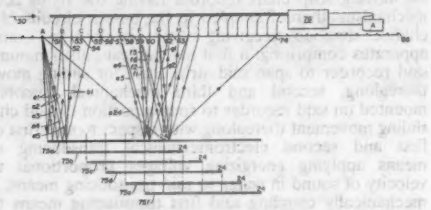
upon the amplitudes of such peaks. The control function is then compared against a threshold level and events exceeding such threshold are given significant emphasis relative to other events not exceeding the threshold.



3,571,788
METHOD AND APPARATUS FOR PRODUCING SPACE AVERAGED SEISMIC DATA

Milo M. Backus, and William A. Schneider, Dallas, Tex., assignors to Texas Instrument Incorporated, Dallas, Tex.

Continuation of application Ser. No. 714,751, Mar. 20, 1968, now abandoned, which is a Continuation of application Ser. No. 550,314, May 16, 1966, now abandoned. This application Sept. 22, 1969, Ser. No. 860,113
Int. Cl. G01v *1/28*
U.S. Cl. 340—15.5 24 Claims



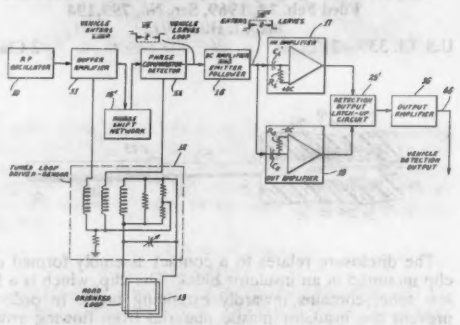
A method and system for producing time- and space-averaged displays of seismic signals from a suite of common depth point seismic records. Primary crosscorrelation signals are generated by selectively crosscorrelating the same limited time gate of a plurality of sets of pairs of traces from all the seismic records. The pairs of traces in each of the sets each include energy thereon which travels to and from subsurface reflecting points over corresponding pairs of paths of first and second geometries, respectively. Primary correlation signals for each of the sets are summed to produce a set of output correlation signals which are displayed on a common correlation scale in the order of increasing space lag.

3,571,789
VEHICLE PRESENCE LOOP DETECTOR

Bernard J. Midlock, Norwalk, Conn., assignor to LFE Corporation, Waltham, MA

Filed Nov. 21, 1968, Ser. No. 777,854
Int. Cl. G08g *1/01*
U.S. Cl. 340—38 11 Claims

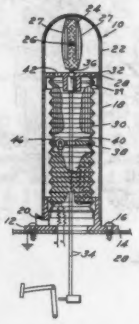
A vehicle presence detection system comprising an electrical signal generating system including a tuned circuit having a large magnetic field producing induction loop for receiving a vehicle in proximity thereto to change the field configuration and corresponding signal phase resulting therefrom, a phase comparator-detector for receiving said generated signals including the phase variations resulting from such field changes to produce a variable DC signal voltage which changes from a resting level to a second level in one direction of change in response to entrance of a vehicle into proximity to the loop and which changes in the opposite direction from the second level substantially to the resting level upon departure of the vehicle from such proximity to the loop, an in-amplifier for receiving said variable DC signal voltage to produce an output electrical signal responsive to said DC signal change of relatively rapid rate in the one direction of change, an out-amplifier for also receiving the variable DC signal voltage to produce a second output electrical signal responsive to said DC signal change in such opposite direction at a relatively rapid rate of change, a gating or latchup circuit for receiving the in-amplifier and out-amplifier output signals to produce a further output signal substantially throughout the period between the first and second output electrical signals, and indicator means for receiving the gated further output signal for producing an indication of the presence of the vehicle in proximity to the inductive loop. The in-amplifier includes a time delay circuit to maintain its output electrical signal for a brief time period while a vehicle is maneuvering in proximity to the loop without departing.



3,571,790
VEHICLE EXTERNAL SPEED INDICATOR

Walter D. Lusebrink, 20024 Edmunton Drive, St. Clair Shores, Mich.

Filed Nov. 1, 1967, Ser. No. 679,765
Int. Cl. B60q *1/54*
U.S. Cl. 340—62 7 Claims

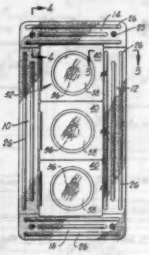


This patent discloses a vehicle speed and direction of travel visual indicator adapted for mounting on an external surface of the vehicle. The device employs a signal element the displacement of which indicates the speed, acceleration and deceleration of the vehicle and a rotating signal ball which indicates in all directions when the brakes of the vehicle are applied. The direction of travel of the vehicle is indicated by suitable color coding of the signal element.

3,571,791
ADJUSTABLE SIGNAL BACK PLATE

Alfred P. Parduhn, Rte 2, Box 33, Oklahoma City, Okla.

Filed Feb. 3, 1969, Ser. No. 795,854
Int. Cl. B60g 1/26
U.S. Cl. 340—87 13 Claims

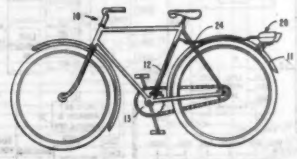


A backplate structure for use with traffic signal light devices for framing the signal device to improve its visibility. The backplate is generally rectangular in configuration and includes two relatively long, substantially parallel side panels and two shorter substantially parallel end panels. The side panels are joined to the end panels by adjustable connections which permit the total area enclosed by the backplate to be enlarged or diminished to accommodate various sizes of traffic signal light structures. The side panels have inturned flanges for mounting the backplate to the housing of traffic signal light devices, and the side and end panels each have longitudinally extending reinforcement ribs formed therein for strengthening the backplate which is preferably made from a lightweight thermoplastic material.

3,571,792
BICYCLE STOPLIGHT CONTROLLED BY SPROCKET WHEEL

Francis Sullivan, Canoga Park, Calif., assignor to Walter G. Mortensen; Donald R Mauran; Francis Sullivan and James B. Davidson, Sherman Oaks, Calif.

Filed Dec. 5, 1968, Ser. No. 781,467
Int. Cl. G08b 5/36
U.S. Cl. 340—134 7 Claims



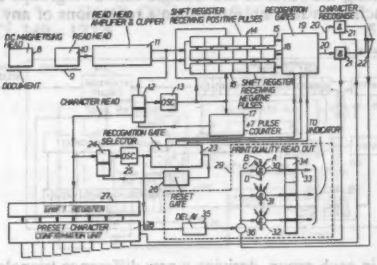
A bicycle stoplight that includes a small wheel having a frictional surface and positioned generally perpendicular to the bicycle sprocket wheel and disposed in frictional engagement with one side surface of the sprocket wheel, and switch means associated with the wheel which operates to keep the lamp circuit open when the sprocket is rotating in a forward direction but to close the lamp circuit when the sprocket rotates in a reverse direction.

3,571,793
CHARACTER RECOGNITION SYSTEMS

Ronald H. Britt, Ilford, England, assignor to The Plessey Company Limited, Ilford, England

Filed Aug. 15, 1968, Ser. No. 752,837
Claims priority, application Great Britain, Aug. 16, 1967, 37757/67
Int. Cl. G06k 9/13
U.S. Cl. 340—146.3 3 Claims

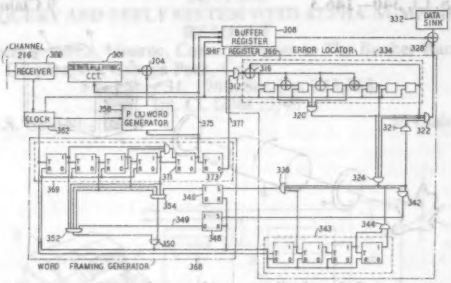
An E13B character recognition system comprising a read head beneath which a character to be recognized is passed to produce a digital signal which is stored in a shift register the content of which is compared in recognition gates for correspondence with a particular character in dependence upon which the gates are set, and in the presence of such correspondence a recognition signal is delivered, sufficient information being available in the shift register also to provide an indication of the print quality of any character to be recognized.



3,571,794
AUTOMATIC SYNCHRONIZATION RECOVERY FOR DATA SYSTEMS UTILIZING BURST-ERROR-CORRECTING CYCLIC CODES

Shih Y. Tong, Middletown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 27, 1967, Ser. No. 670,942
Int. Cl. G06f 11/12; G08c 25/00
U.S. Cl. 340—146.1 18 Claims



A method of providing automatic synchronization recovery in data transmission systems utilizing *b*-burst-error-correcting cyclic codes is disclosed. Synchronization recovery is accomplished by utilizing error patterns which, although not likely to occur in a transmission channel subject to burst error are nevertheless correctable by burst-error-correcting cyclic codes. In particular, the patterns utilized are those indicating that errors have occurred (simultaneously) at each end, but not the middle of the data word. By adding a specific preselected data sequence to each data word to be transmitted, subtracting the same fixed sequence from the received data sequences, and then decoding each resulting data word, such unlikely error patterns are obtained. These patterns indicate whether or not a synchronization gain or loss of up to $b-2$ symbols has occurred.

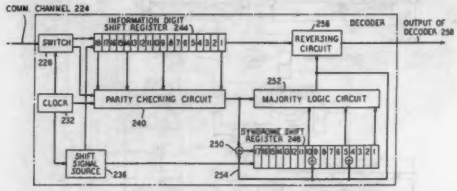
3,571,795
RANDOM AND BURST ERROR-CORRECTING SYSTEMS UTILIZING SELF-ORTHOGONAL CONVOLUTION CODES

Shih Y. Tong, Middletown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 9, 1969, Ser. No. 831,603
Int. Cl. G08c 25/00; H04l 1/10
U.S. Cl. 340—146.1 23 Claims

Sequences of information, encoded in a self-orthogonal convolution code of rate $(b-1)/b$ and transmitted via a com-

munication channel, are decoded to correct t random errors and bursts of B blocks where each block is b bits in length. The interconnections of the information digit shift registers of the encoder and decoder and their respective parity check digit generating circuits are determined by deriving a difference triangle of order $\lambda=(b-1)t$ and of size $(b-1)$ $(t+1)$, partitioning the rows of the triangle into $b-1$ groups of $t+1$ rows each such that no more than t repetitions of any entry



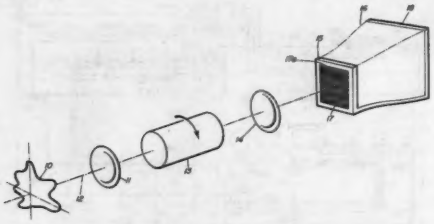
appear in each group, deriving a new difference triangle from each of the $b-1$ groups by inserting $t-2$ zeros at the top of the first column of each group and expanding the column into a difference triangle, and reconstructing each new triangle by multiplying each entry by B, and incrementing various entries until each entry of all triangles is different from all other entries of all triangles. The diagonal entries of the resulting triangles determine the interconnections.

3,571,796

ROTATION TRANSLATION INDEPENDENT FEATURE EXTRACTION MEANS

Richard D. Brugger, Erie, Pa., assignor to The Bendix Corporation

Filed May 28, 1968, Ser. No. 732,603
Int. Cl. G06k *9/00*
U.S. Cl. 340—146.3 **9 Claims**



A means of electrically extracting optical information from an optically recognizable pattern regardless of the orientation of the pattern within the field of view and comparing the information extracted against electrical criteria so as to classify the pattern wherein the pattern image is projected onto an image slicer which utilizes fiber optics to divide the image into a plurality of slices. Electrical processing is used to assign a number to each slice which is proportional to the light flux incident upon the slice and to square the assigned number. All the squared numbers are added to generate a voltage which is memorized. The image is then rotated with respect to the slicer and subsequent voltages are generated and memorized. The memorized voltages are then compared to an electrical template to determine the classification of the pattern and its orientation within the field of view.

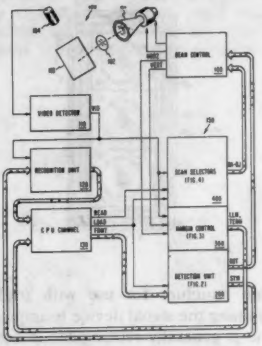
3,571,797

AREA-FORMAT CONTROL IN A CHARACTER-RECOGNITON SYSTEM

William W. Hardin, and Patrick J. Traglia, Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 2, 1969, Ser. No. 829,409
Int. Cl. G06r *9/04*
U.S. Cl. 340—146.3 **15 Claims**

Scan-control apparatus responsive to a format word specifying an outline of a document field to be scanned generates a series of search patterns for characters within the field. A "read" command causes a scanning beam to move in a line-search scan downwardly from one corner of the field. When black video is detected by this scan, a character-search scan moves the beam horizontally to establish the beginning of a character line. The first character found is normalized and a recognition scan is initiated. Reaching a selected format end-



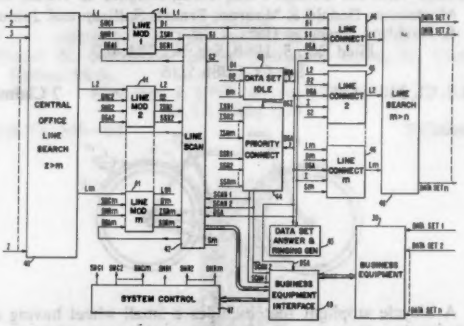
of-line boundary terminates the "read" command. Further "load-format" and "read" commands cause the beam to continue to search for and read character lines within the boundary. The field is terminated when the scanning beam attains a selected vertical boundary of the format word. A single field may contain a number of rectangular sections.

3,571,798

TWO LEVEL SWITCHING SYSTEM

Glenn E. Dawson, Cherry Hill, N.J., and Michael Teig, Yonkers, N.Y., assignors to International Business Machines Corporation, Armonk, N.J.

Filed Nov. 13, 1968, Ser. No. 775,364
Int. Cl. H04q *3/64*
U.S. Cl. 340—147 **8 Claims**



A two level switching system to be used in communications systems, comprising a first means for placing a plurality of input lines in a Hold Mode of operation, a second means for maintaining a plurality of input lines in an Operating Mode of operation, and means for connecting and disconnecting input lines in an Operating Mode of operation into a Hold Mode of operation at the initiation of the user or of the system itself.

3,571,799

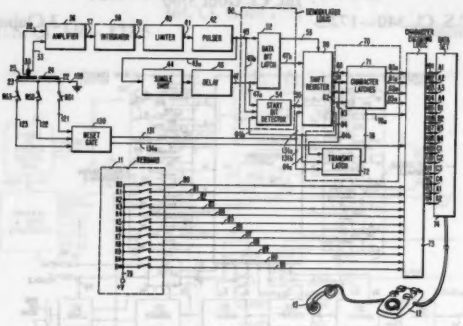
DATA TRANSMISSION TERMINAL

Charles W. Coker, Jr; Harry W. Johnson; Robert A. Peterson, Los Gatos, and John N. Stallard, San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 21, 1969, Ser. No. 851,976
Int. Cl. G11b *5/00;* **H04m** *11/00;* **H04a** *9/00*
U.S. Cl. 340—152 **11 Claims**

A credit authorization terminal for sensing identification data from a magnetic credit card and transmitting the same

to a central processor over telephone lines. Also, a keyboard for transmitting variable transaction data. Magnetic data is recorded on the credit card in two modes, only one of said



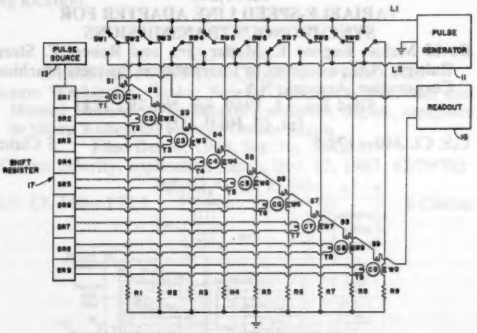
modes being intelligible to the terminal read head. Also, a terminal identification magnetic card. Credit verification or authorization is by voice answerback.

3,571,800

PLURAL POSITION SWITCH STATUS AND OPERATIVENESS CHECKER

Leon V. Taylor, and Thomas B. Ballard, Hampton, Va., assignors to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Sept. 15, 1967, Ser. No. 668,242
Int. Cl. H04g *1/00, 3/00, 5/00*
U.S. Cl. 340—166 **4 Claims**



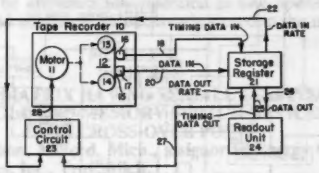
This invention is an apparatus for checking the status of a plurality of switches. In one embodiment, a matrix of magnetic cores are connected to the common terminals of a plurality of double-throw switches. A pulse is then applied to the normally closed side of the switches. This pulse energizes any of the cores that are connected to switches that are in the normally closed position. The matrix of magnetic cores is then read out. Following this, a pulse is applied to the normally open side of the switches. This second pulse energizes any of the cores that are connected to switches that are in the normally open position and the matrix is again read out. The readouts are then compared. If the readouts for any particular switch are complements, the status of the switch can be identified. If the readouts for any particular switch are the same, a defective switch condition or a defective switch wiring condition is indicated. Hence, the status and operativeness of the switches are both determined by the invention.

3,571,801

DATA TRANSFER SYSTEM

John E. Coolidge, Anaheim, and John F. Kinkel, Newport Beach, Calif., assignors to Granted to National Aeronautics & Space Administration under provisions of 42 USC 2457(d)

Filed June 3, 1966, Ser. No. 555,189
Int. Cl. G06f *3/00;* **G11b** *5/00*
U.S. Cl. 340—172.5 **5 Claims**



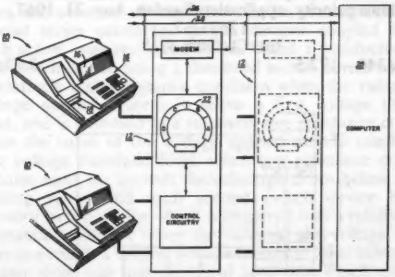
A data acquisition system effects readout by clocking data from a tape into a storage register under control of a tape shift register. Data is clocked out of the data storage register by a clock shift register. A system clock drives a shift register and divide by 10 circuit which both regulates the translation of the data clocked out of the storage register from a parallel to a precise serial format, and also drives the clock shift register. Output signals from the tape shift register and from the clock shift register drive a digital servocontrol circuit to regulate the speed of the motor which drives the tape transport, to insure the data storage register neither "overflows" nor "runs dry."

3,571,802

QUERY AND REPLY SYSTEM WITH ALPHA-NUMERIC READOUT

John J. Serra, Monroe, Conn., assignor to The Bunker-Ramo Corporation, Canoga Park, Calif.

Filed May 31, 1968, Ser. No. 733,365
Int. Cl. G06f *15/40*
U.S. Cl. 340—172.5 **35 Claims**

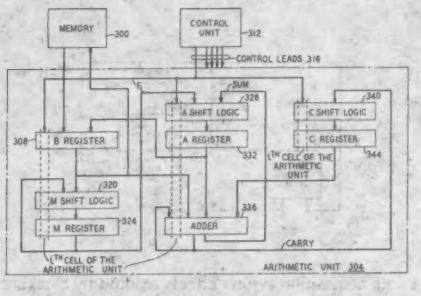


A query and reply system particularly for use in savings banks to aid in processing calls such as deposits and withdrawals, and including a number of remote teller machines each having (1) a data entry keyboard, (2) a CRT display device for presenting alphanumeric characters corresponding to data entered on the keyboard, and (3) a line printer for printing data in the customer's passbook. The remote station sends queries through a time-sharing multiplex arrangement to a central computer which produces corresponding answers for retransmittal to the querying teller machine. The answer signals are stored in a recirculating memory and are used to control the operation of the line printer so that the answer data can be placed directly in the customer's passbook. The system also includes an off-line option permitting certain computations to be made locally without the aid of the central computer.

3,571,803
ARITHMETIC UNIT FOR DATA PROCESSING SYSTEMS

John H. Huttenhoff, Succasunna, and Richard R. Shively, Convent Station, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 4, 1968, Ser. No. 734,428
Int. Cl. G06f 7/38; G11c 19/00
U.S. Cl. 340—172.5 12 Claims

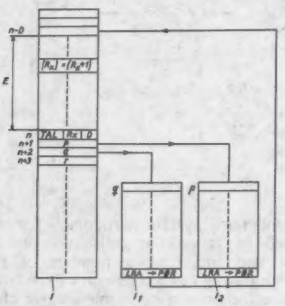


An arithmetic unit of a data processing system having the capability of designating any digit position of the data words being processed as the most significant digit position to thereby increase the efficiency of processing. More than one most significant digit position in a data word may be so designated. Designating a most significant digit position is realized by circuitry in the arithmetic unit which (1) inhibits data from being shifted from the most significant digit position to adjacent positions in one direction, (2) inhibits arithmetic carrys from propagating from the most significant digit position to said adjacent positions, and (3) causes the sign digit of a data word to be copied into the most significant digit position as well as being shifted to adjacent positions in the other direction on certain "arithmetic" shifts of the data word.

3,571,804
METHOD FOR EXECUTION OF JUMPS IN AN INSTRUCTION MEMORY OF A COMPUTER

Goran Anders Henrik Hemdal, Tyreso, and Ferenc Belina, Trangsund, Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed July 24, 1968, Ser. No. 747,375
Claims priority, application Sweden, Aug. 31, 1967, 12071/67
Int. Cl. G08f 9/18
U.S. Cl. 340—172.5 3 Claims

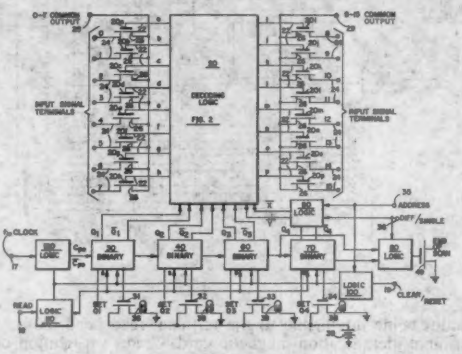


A computer system performs a jump instruction routine in a program of sequentially available addressed instructions. A jump instruction which includes an operator part and a variable part is stored in at a given address. When the jump instruction is performed the variable part is used to modify the present address of the jump instruction to establish a return address and also another address to indicate where a subroutine is stored.

3,571,805
RANDOM OR SEQUENTIAL ACCESS MULTICHANNEL MULTIPLEXER

Duane C. Fox, Fullerton, Calif., assignor to North American Rockwell Corporation

Filed Aug. 7, 1968, Ser. No. 750,840
Int. Cl. G06f 3/00
U.S. Cl. 340—172.5 3 Claims

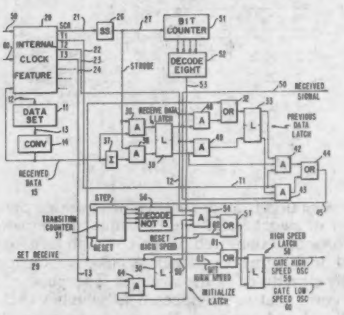


A multipurpose multiplexer comprised of a four-bit binary counter, the outputs of which are coupled to a means for logically decoding all of the counter states. A plurality of switch circuits are connected to respond to the decoded states, to open or close, and thereby complete circuit paths for a corresponding plurality of input terminals to one or more output terminals. Means are provided for controlling the switches in a single-ended or differential mode; one switch is activated for each state while in the single-ended mode, while two switches are simultaneously activated for each state in the differential mode.

3,571,806
VARIABLE-SPEED LINE ADAPTER FOR SYNCHRONOUS TRANSMISSIONS

David Makie; Eugene E. Mallar, Jr., and Robert F. Steen, Raleigh, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 14, 1969, Ser. No. 792,221
Int. Cl. H04l 25/50
U.S. Cl. 340—172.5 5 Claims

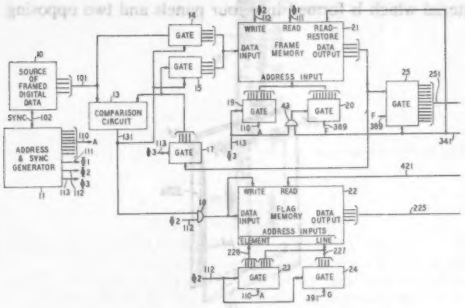


A line adapter for data transmission systems is provided with a pair of oscillators for enabling reception of signals at two different rates. An initial synchronizing character is analyzed to determine the number of voltage transitions during the period needed for transmission of the character at the higher transmission rate. If the number of transitions counted does not correspond with the number of voltage transitions in the character, a shift is made to a lower speed oscillator for data reception at the slower rate.

3,571,807
REDUNDANCY REDUCTION SYSTEM WITH DATA EDITING

James C. Candy, Convent Station, and Frank W. Mounts, Colts Neck, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 13, 1968, Ser. No. 775,458
Int. Cl. G06f 7/02
U.S. Cl. 340—172.5 7 Claims

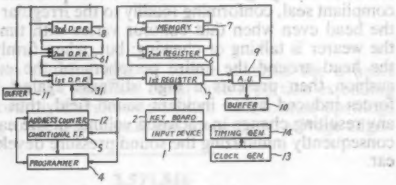


A redundancy reduction system is described for use with signals such as video signals which have frame-to-frame redundancy. An entire frame of samples from the signal is stored in a frame memory. Each new sample from the signal is compared with its corresponding stored sample having the same time position within the frame. If a significant difference is found to exist between the two samples, the new sample is placed into the frame memory replacing the old sample, and in addition an identification or flag signal is placed into a flag memory at a corresponding address. A searching circuit scans the flag memory and detects those address locations which have been marked by a flag or identification signal. In response to detecting a flag at a particular address location the sample stored in the frame memory at that address location is read out of the frame memory and coupled to a digital transmitter for transmission to a receiving location.

3,571,808
DECIMAL POINT PROCESSING APPARATUS

Isamu Washizuka, Osaka; Satoshi Teramura, Nara-shi, and Hitoshi Hanahara, Yamatokoriyamia-shi, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 6, 1968, Ser. No. 781,849
Claims priority, application Japan, Dec. 12, 1967, 42/79702
Int. Cl. G11b 13/00
U.S. Cl. 340—172.5 6 Claims

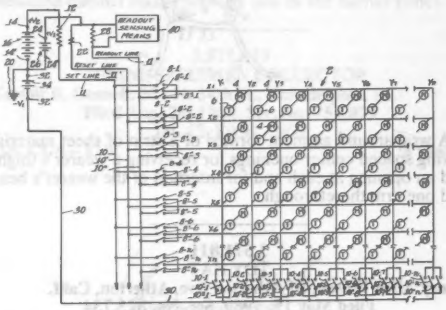


A computer having registers in which a plurality of memory cells are connected in cascade in correspondence with the desired number of bits, only one of said memory cells is arranged to have an operational state different from those of all of the other memory cells and the bit location of said memory cell having the operational state (memory state) different from the others is caused to correspond to a numerical value to be stored, means of shifting said bit location of said memory cell having the operational state different from the others to another bit location, and shift control means for determining said bit location to which said bit location of said memory cell having the operational state different from the others is to be shifted in correspondence with a numerical value to be arithmetically operated as one operand with respect to said numerical value already stored in the register.

3,571,809
MEMORY MATRIX HAVING SERIALLY CONNECTED THRESHOLD AND MEMORY SWITCH DEVICES AT EACH CROSS-OVER POINT

David L. Nelson, Milford, Mich., assignor to Energy Conversion Devices, Inc., Troy, Mich.

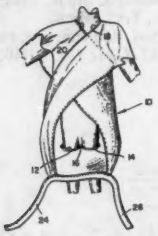
Filed Nov. 4, 1968, Ser. No. 773,001
Int. Cl. G11c 11/36; H03k 19/12
U.S. Cl. 340—173 5 Claims



A memory matrix of X and Y axes conductors forming rows and columns of conductors to be addressed, first and second series connected switch devices coupled between each active crossover point of the X and Y conductors, each first switch device being a threshold switch device which has a relatively high resistance condition when the value of the voltage applied thereto is below a first voltage threshold level, and is switched to a relatively low resistance condition when the value of the voltage applied thereto reaches said first voltage threshold level which low resistance condition remains until the current therethrough drops below a given holding value, and each second switch device being a memory switch device which is triggered into a relatively low resistance condition when the value of the voltage applied thereto exceeds a second voltage threshold level substantially greater than said first threshold level and which condition remains in such low resistance condition independently of the presence or absence of an applied voltage until reset to a high resistance condition with the feeding of a reset current pulse therethrough, the resistance of said high resistance condition of the threshold switch device at each crossover point most advantageously being at least 10 and preferably 1000 times greater than the resistance of the high resistance condition of the memory switch device thereat.

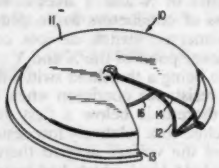
GENERAL AND MECHANICAL

3,571,810
WRAPAROUND GARMENT
Zwi Swett, Afika, Israel, assignor to Benjamin D. Kaufman, New York, N.Y.
Filed Dec. 18, 1969, Ser. No. 886,065
Int. Cl. A41d *7/00, 15/04*
U.S. Cl. 2—69 **5 Claims**



A wraparound garment formed of a strip of sheet material having spaced center openings for receiving a wearer's thighs and an opening at each end for insertion of the wearer's head and one arm therethrough.

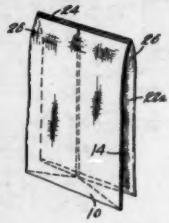
3,571,811
TOY HAT
Henry Allen Wilson, 81 Atherton Ave, Atherton, Calif.
Filed May 19, 1969, Ser. No. 825,734
Int. Cl. A42b *1/02*
U.S. Cl. 2—195 **3 Claims**



The sailor type hat is constructed for dual uses due to its unitary structure having differently contoured surfaces on opposite sides thereof whereby said unitary surfaces of the device cooperate to provide a cool lightweight head cover as well as an improved discus-shaped throwing game piece. The contoured surfaces on opposite sides of the unitary head cover cooperating when twirled in throwing produces therein improved lift and controlled flight through the air over long distances.

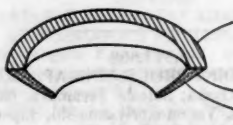
3,571,812
CAP CONSTRUCTION AND THE METHOD OF MAKING SAME
Robert Norman Speevak, Montreal, Quebec, and Joseph George Robert Paquin, Roxboro, Quebec, Canada, assignors to Johnson & Johnson
Filed Mar. 6, 1969, Ser. No. 804,807
Claims priority, application Canada, Mar. 7, 1968, 014,308
Int. Cl. A42b *1/22*
U.S. Cl. 2—197 **2 Claims**

The hat or cap disclosed is made of a sleeve of flexible material which is formed into four panels and two opposing



panels are then folded inwardly. All of the panels are joined together at one end of the sleeve to form the cap.

3,571,813
ACOUSTICAL EAR MUFF WITH CONE-TYPE CUSHIONS
Clayton H. Allen, Wellesley, Mass., assignor to Bolt Beranek and Newman Inc., Cambridge, Mass.
Filed May 21, 1969, Ser. No. 826,319
Int. Cl. A41d *21/00*
U.S. Cl. 2—209 **2 Claims**



This disclosure deals with a novel acoustical ear muff and the like employing a novel cushion that provides a soft and compliant seal, conforming readily to the irregular contour of the head even when that contour varies with time, as when the wearer is talking or chewing; but, when firmly sealed to the head around the entire periphery of the cushion, the cushion then presents a high stiffness against alternating forces induced by an incident sound field, thus minimizing any resulting change in enclosed volume of the ear muff and consequently minimizing the sound pressure developed at the ear.

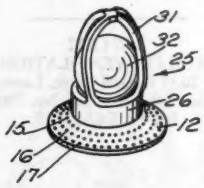
3,571,814
WAISTBAND CONSTRUCTION
Samuel E. Miller, Wilmette, Ill., assignor to Quick Service Textiles, Inc., Chicago, Ill.
Filed Apr. 25, 1969, Ser. No. 819,131
Int. Cl. A41d *1/06*
U.S. Cl. 2—236 **2 Claims**

A waistband for wearing apparel, e.g. trousers, which includes a woven strip to preclude rolling over of the outer edge portion of the waistband. In order to perform its function the strip has a degree of inherent rigidity but is flexible in the sense that its presence does not discommode the

wearer. These characteristics are obtained by using a comparatively stiff thread in the weft, usually a monofilament of nylon or the equivalent. Since the strip is usually slit from

wider goods the edges are rough or erose. Furthermore, since the weft threads are short and comparatively rigid the warp threads are inadequate to anchor them, so that they are free to slide and thereby present this rough or erose edge configuration which can puncture and/or abrade the adjacent shell fabric. The disclosure relates to an edge construction for the strip to avoid this undesirable behavior.

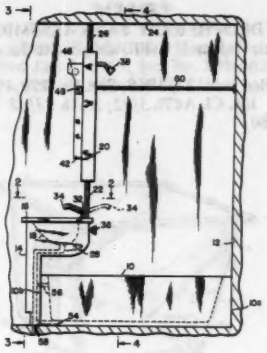
3,571,815
SUTURE RING FOR HEART VALVE
John V. Somyk, 10 View St., Lincoln, R.I.
Continuation-in-part of application Ser. No. 541,789, Apr. 11, 1966, now abandoned. This application Sept. 19, 1968, Ser. No. 760,814
Int. Cl. A61f 1/22
U.S. Cl. 3—1 **8 Claims**



A seamless suturing ring of textile material for a heart valve which has a cylindrical collar with a portion extending radially outwardly therefrom provided with formed openings for suturing to the heart tissue and a peripheral selvage edge.

3,571,816
COMPOSITE BATHROOM FIXTURE
Lee W. Mc Cullough, 53 Normandy Road, Yonkers, N.Y.
Filed Aug. 29, 1969, Ser. No. 854,075
Int. Cl. A47k 3/18
U.S. Cl. 4—4 **8 Claims**

A composite bathroom fixture with a lavatory overhanging one end of a bathtub, a barrier panel extending upwardly over the rear side of the lavatory, a shower head on the bathtub side of the panel, single hot and cold water valve means accessible from both the lavatory and bathtub, and with director means for selectively controlling the flow of water from the valve means into the lavatory, bathtub or shower head, and a pair of vertical pipes spacing the lower end of the barrier panel from the lavatory respectively enclosing the supply pipe to the shower head and the electrical



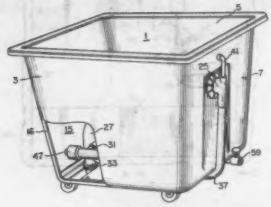
conduit to a lamp and electrical outlet adjacent a mirrored medicine cabinet on the lavatory side of the barrier panel.

3,571,817
URINE SPECIMEN COLLECTOR
Kermit B. Gosnell, 311 N. 34th St., Philadelphia, Pa.
Filed Aug. 28, 1968, Ser. No. 755,879
Int. Cl. E03d 13/00
U.S. Cl. 4—110 **5 Claims**

A urine specimen collector comprising a pair of rods which may be rotated toward and away from each other. A flexible specimen bag is secured to the two rods. One rod is rigidly mounted on a toilet bowl and the other rod is rotatably mounted with respect to the rigidly mounted rod. The pivoting of the rotatably mounted rod will open the flexible bag and position the bag beneath the urine stream of a patient sitting on the toilet whereby a urine specimen can be collected in the bag. When a sufficient specimen is collected,

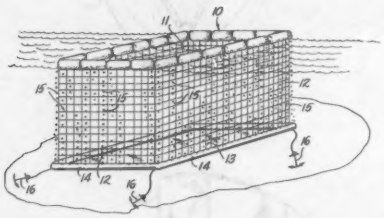
the rotatable rod is pivoted toward the fixed rod and subsequently the bag containing the specimen is removed from the rods.

3,571,818
HYDROTHERAPY TANK ASSEMBLY
Roy A. Jacuzzi, Oakland, Calif., assignor to Jacuzzi Research, Inc.
Filed Nov. 27, 1968, Ser. No. 779,491
Int. Cl. A47k *3/02*; A61h *33/02*
U.S. Cl. 4—180 4 Claims



A self-contained hydrotherapy tank assembly of the hip tank type having an interior seat forming an exterior chamber, and a built in hydromassage system including a hydroair jet head assembly mounted in a wall of the tank, a pump installed in the exterior chamber, the pump having its suction end flow connected with the interior of the tank, and its discharge end connected to the hydroair jet head assembly. An adjustable heater is provided in the system to maintain the temperature of water within a desired temperature range.

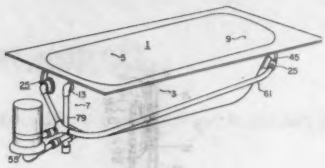
3,571,819
BATHING DEVICE
Joseph F. Puncochar, 205 Commonwealth Ave., Alexandria, Va.
Filed Nov. 12, 1969, Ser. No. 875,709
Int. Cl. A47k *3/00*
U.S. Cl. 4—171 7 Claims



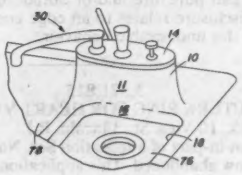
A water-permeable bathing device is provided for separating a section of water from a main body thereof in which floats are used to mark off the section of water to be protected and a vertical openwork barrier is secured to the floats and extends downwardly therefrom to the desired depth, and means are provided to release bubbles of gas at the bottom of the barrier to provide a curtain of rising bubbles in the immediate vicinity of the barrier to cooperate with the barrier and exclude undesirable sea organisms.

3,571,820
HYDROMASSAGE BATH INSTALLATION
Roy A. Jacuzzi, Oakland, Calif., assignor to Jacuzzi Research, Inc.
Filed June 6, 1968, Ser. No. 734,960
Int. Cl. A47k *3/00*
U.S. Cl. 4—180 8 Claims

A hydromassage bath installation wherein a jet assembly is mounted in a vertical wall of a bath tank in spaced relationship to the drain opening, with all flow passages in the circulatory system being above a drain line valve to assure a sanitary isolation of the drain line from the circulatory system during use, and further assure complete emptying of the bath water to the drain line upon opening of the drain valve.

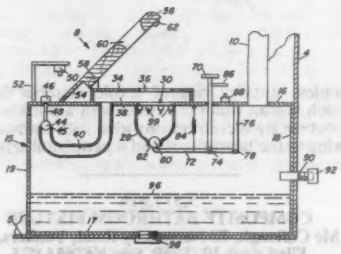


3,571,821
PLUMBING FIXTURES
Jack N. Kaiser, Louisville, Ky., assignor to American Radiator & Standard Sanitary Corporation, New York, N.Y.
Continuation of application Ser. No. 538,810, Mar. 30, 1966, now abandoned. This application July 18, 1969, Ser. No. 847,514
Int. Cl. E03c *1/04*
U.S. Cl. 4—192 9 Claims



A plumbing fixture, in particular, a kitchen sink is provided with a raised section which houses a variable number of accessories. A removable escutcheon closes the open top. A support member is positioned within the raised section for carrying and supporting the water faucet.

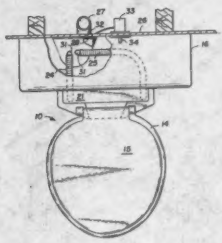
3,571,822
TOILET FACILITY VENTILATION SYSTEM
Hugh E. Shaw, Jr, 2639 Russell Drive, Lower Burrell, Pa.
Filed Jan. 10, 1969, Ser. No. 790,202
Int. Cl. E03d *9/05*
U.S. Cl. 4—213 18 Claims



A toilet facility ventilating system for preventing objectionable odors from escaping into the room in which the facility is located by introducing a negative pressure into the system while the facility is in use and during the flushing operation. The facility includes a bowl for receiving the waste mounted in a holding tank housing which stores the waste after the flushing operation and a ventilating system which will keep a negative pressure in the facility during use and the flushing operation. The ventilating system is ac-

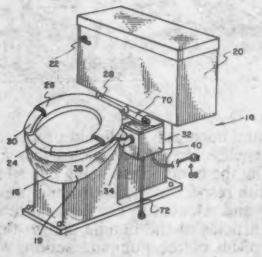
tivated by a seat switch for ventilation during use, and a flushing handle switch for ventilation during the flushing operation.

3,571,823
TOILET VENTILATION SYSTEM
John S. Lundberg, 30 Laburum Crescent, Rochester, N.Y.
Filed Apr. 1, 1969, Ser. No. 811,949
Int. Cl. E03d 9/05
U.S. Cl. 4—213 9 Claims



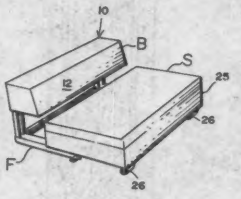
A toilet ventilation system uses a simple, plastic intake secured under the toilet seat bolts and carrying plastic hose connectors so flexible hose can connect the intake with a cover plate mounted over a support plate over a hole in the wall behind the toilet to lead to a flexible exhaust hose. A fan motor is arranged somewhere in the exhaust line, and a switch above the toilet in the wall behind the toilet is arranged for operating the fan motor. The particular arrangement of parts allows simple and convenient installation on a variety of toilets.

3,571,824
TOILET STOOL VENTILATING MEANS
Clarence E. Poister, P.O. Box 68, Fairview, Kans.
Continuation-in-part of application Ser. No. 634,969, May 1, 1967, now Patent No. 3,491,382. This application Dec. 8, 1969, Ser. No. 883,104
Int. Cl. E03d 9/05
U.S. Cl. 4—213 10 Claims



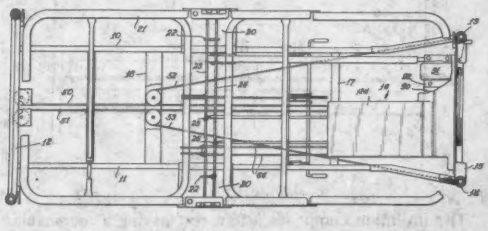
The invention has a generally annular air chamber mountable below the seat and above the rim of a toilet bowl, and has openings thereto for receiving normally contaminated air from the toilet bowl, and an outlet to transmit the air to a filter element where it is deodorized and passed into the atmosphere. The filter element has a housing, an outlet, an inlet, an easily removable closure, and a blower therein adapted to move the normally contaminated air through the filter element and an easily replaceable filter cartridge therein. The filter element cartridge is easily replaced by removal of the filter element closure and is placed in the airstream through the filter element. The cartridge has baffles to direct the air back and forth transversely through the filtering material deodorizing same. The air chamber outlet and the filter element are operably connected by a conduit means. A switch, operably connected to the blower in the filter element is activated by pressure exerted on the seat as in normal use.

3,571,825
AUTOMATIC SOFA BED
David Bendell, 7240 S.W. 125th St., Miami, Fla.
Filed July 7, 1969, Ser. No. 839,602
Int. Cl. A47c 17/14, 17/22
U.S. Cl. 5—17 4 Claims



An automatic sofa bed having a pair of rectangular frame members, one slidably mounted on the other. The upper frame member having floor-engaging rollers at its forward edge portion with further rollers at its rear edge portion engaging tracks formed on the lower frame member. The lower frame member having a bolster support along its rear portion and a latch at its forward edge for securing the upper frame member at its retracted position for use as a sofa with a pair of adjustable spring members yieldingly urging the upper frame member to slide to its extended position for use as a bed and which requires a minimal of force to return the upper frame member to its retracted position for use as a sofa.

3,571,826
POWER UNIT FOR FRICTION DRIVE HOSPITAL BED
Francis J. Burst, Batesville, Ind., assignor to Hill-Rom Company, Inc., Batesville, Ind.
Filed Dec. 5, 1968, Ser. No. 781,564
Int. Cl. A61g 7/06, 7/00; F16h 15/00
U.S. Cl. 5—67 8 Claims

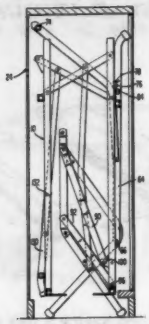


A friction drive power unit for an electric hi-low hospital bed which unit includes control means accessible to and operable by a patient in the bed to operate the bed in a desired manner. The unit includes an interlock which prevents simultaneous operation of the hi-low and spring moving mechanisms of the unit, and includes limit position control of these devices.

3,571,827
FOLDING BED LINKAGE
Walter Clark Rogers, Jr., High Point, N.C., assignor to Royal Development Company Inc., High Point, N.C.
Filed Jan. 15, 1969, Ser. No. 791,475
Int. Cl. A47c 13/36, 17/40
U.S. Cl. 5—149 16 Claims

A folding bedframe including front and rear frame sections movable between a retracted vertical position wherein the

bed frames are in generally parallel relationship, and an extended horizontal position wherein the bedframe sections are in generally coplanar relationship with the front bedframe section projected forwardly from the rear bedframe section. A first linkage mounts the rear frame section to an anchor means for swinging movement between a retracted vertical position and an extended horizontal position. Support for the

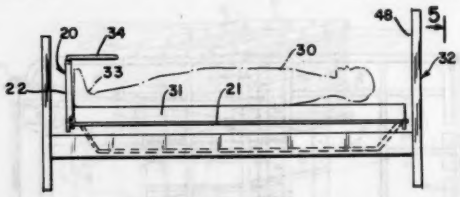


rear frame section while in the horizontal position is provided by a second linkage pivotally connected to the anchor means for movement independently of the first linkage between a retracted position, and an extended position resting on the floor with the rear frame section engaged thereon. The front frame section is supported on the floor by means of a link which pivots into engagement on the floor when the front frame section is fully extended.

3,571,828
FOOT REST DEVICE

Delton E. Bergsgaard, 423 Euclid Ave, and Palmer E. Berger, 1716 12th Ave, North, Grand Forks, N. Dak.

Filed Sept. 13, 1968, Ser. No. 759,726
Int. Cl. A47c *21/00*
U.S. Cl. 5—327 **2 Claims**



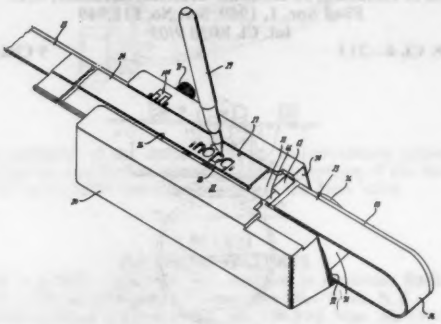
The invention comprises a foot rest having a rectangular plate serving as a foot support mounted upright to the edge of a hospital bed spring frame, a U-shaped rope slideably mounted in said plate and adapted to be slid upwardly and forwardly to serve as a blanket support, an adjustable foot support member adapted to be collapsed against said rectangular plate when not in use and adapted to be expanded to serve as a foot support spaced forward from said rectangular plate.

3,571,829
TAPE LETTERING APPARATUS

David W. Souza, Fremont, Calif., assignor to Uniline Corporation

Filed Mar. 27, 1969, Ser. No. 810,985
Int. Cl. B25f *1/00*
U.S. Cl. 7—14.1 **14 Claims**

An assembly for printing label tape including a body having tape guideways formed therein, a tape dispenser detachably mounted to the body adjacent one end of the bed and having a roll of tape disposed therein for withdrawal of a continuous length of tape therefrom into aligned registration with the guideways, a manually operable drive wheel carried by the body and having a portion engageable with and for

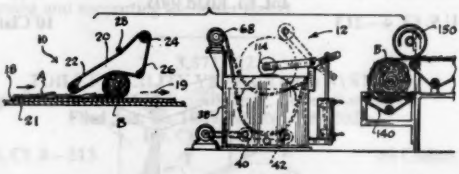


driving the strip of tape in the guideways to a desired longitudinal position relative thereto, and a lettering template slidably carried by the body in overlying relation with the tape and having symbol openings therein selectively registrable with and for printing a surface of the tape in cooperation with a writing implement.

3,571,830
LIQUID PROCESSING OF DISCRETE ARTICLES WITHOUT JOINING SAME

Justin J. Wetzler, Evanston, Ill., assignor to F. W. Means & Co., Chicago, Ill.

Filed May 20, 1969, Ser. No. 826,138
Int. Cl. D96f *35/00*
U.S. Cl. 8—150 **14 Claims**



A process and apparatus for liquid processing of a bundle of discrete articles where the articles first are placed in a defined bundle; the bundle then being placed in a liquid bath and moved with respect to the bath while pressure is alternatively applied and released to cause liquid to move into contact with all articles of the bundle and to flow through the bundle as a result of the pumping action; withdrawing the bundle from the bath and passing the articles through a rinse section to flush out soil and then through a dryer to remove moisture and return the articles to a substantially dry condition and ironing the articles to finished form.

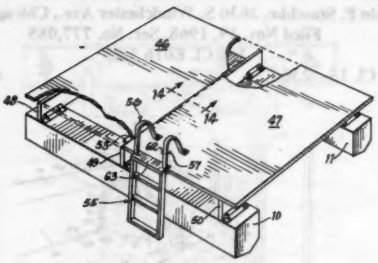
3,571,831
FLOAT

Elmer W. Conklin, St. Joseph, Mich. (600 N. Erie St., P.O. Box 406, Three Rivers, Mich. 49093)

Filed Oct. 4, 1968, Ser. No. 765,054
Int. Cl. B63c *9/04*
U.S. Cl. 9—11 **11 Claims**

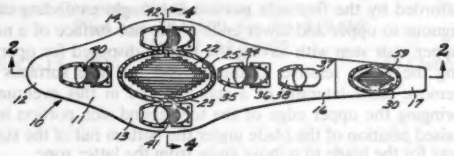
A float comprising one or more vessels of sheet material having a flat top and substantially vertical sides, with transversely placed brackets secured to the top for supporting stringers and a deck, the stringers bearing down upon the

sides of the vessel under downward load, but bearing upward only upon the top thereof. The float may be completely dis-



assembled when stored, or it may be constructed of two parts which may be transported and stored in side-by-side relation to occupy a minimum of space.

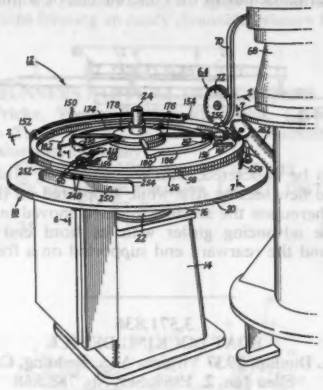
3,571,832
AQUATIC AMUSEMENT DEVICE
Russell E. Rauch, Garden Grove, Calif.
Filed Jan. 22, 1969, Ser. No. 793,080
Int. Cl. A63c *15/02*
U.S. Cl. 9—310 **12 Claims**



An aquatic amusement device having an elongated, generally planar body and including a forward rotatably mounted buoyant float near the front of said body and a smaller rear rotatably mounted buoyant float in a detachable rear section of the body, each of which floats has its plane of rotation parallel to the longitudinal axis of the body; said floats being defined by an operating surface having a center cylinder section of predetermined diameter and a plurality of side cylinder sections on each side of said center cylinder section of smaller diameter than said center cylinder section with annular circular planar sections joining each cylinder section, and there being further provided foot stirrups on said body to permit a person to stand on the device and be pulled by some means.

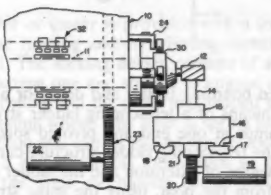
3,571,833
APPARATUS FOR APPLYING NYLON TAB IN A NUT
James W. Cadwallader, 1042 Pine Grove Ave., Lansdale, Pa., and Francis R. Kull, 800 Blue Bell Road, Warminster, Pa.
Filed July 22, 1968, Ser. No. 746,637
Int. Cl. B21d *53/24*
U.S. Cl. 10—72 **11 Claims**

A continuously moving support is provided to receive threaded female fastener elements from a continuous-feed mechanism. The fastener elements are moved by the support through a heating zone to a thermoplastic patch insert station where patches of thermoplastic material are inserted into the hot threaded fasteners. The elevated temperature of the threaded fasteners causes the thermoplastic patches to fuse



and bond to the threads of the fastener elements and the fastener elements are then moved to an ejection station where they are collected.

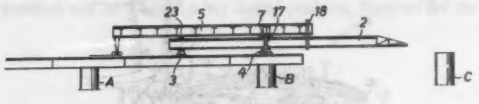
3,571,834
MACHINE TOOL ADAPTIVE CONTROL
Richard A. Mathias, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio
Filed Apr. 15, 1968, Ser. No. 721,508
Int. Cl. B23g *1/00, 11/00*; B23b *39/10, 47/18, 47/24*
U.S. Cl. 10—139 **29 Claims**



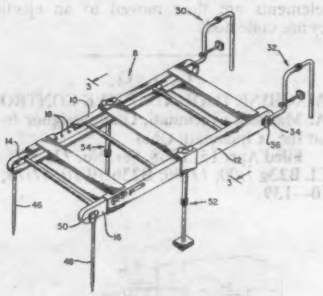
A mechanism controls both the speed of rotation of a cutting tool for performing machine tool operations on a workpiece and the relative feedrate between the cutting tool and the workpiece. The control mechanism includes means to indicate when the life of the cutting tool has ended. The control mechanism has means to provide a minimum relative feedrate between the workpiece and the cutting tool. The mechanism also includes means to permit a relatively rapid movement between the cutting tool and the workpiece when the cutting tool is not engaging the workpiece.

3,571,835
APPARATUS FOR CONCRETING MULTIPLE SECTION STRUCTURES, PARTICULARLY BRIDGE SUPPORTS OF REINFORCED OR PRESTRESSED CONCRETE
Wilhelm Buechler, Munich, Germany, assignor to Dyckerhoff & Widmann kommanditgesellschaft, Munich, Germany
Filed Oct. 29, 1968, Ser. No. 771,553
Claims priority, application Germany, Oct. 30, 1967, P 16 58 587.8
Int. Cl. E01d *1/00*
U.S. Cl. 14—1 **9 Claims**

Apparatus for concreting multiple section or multipanel structures such as elevated highway and bridge structures of reinforced or prestressed concrete, comprising two girders that are movable relative to one another, one of which is a scaffold girder and the other an advancing girder that sup-

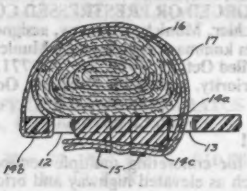
ports the scaffold girder as it is advanced, which girders are generally of the same length and disposed across a section being concreted where they absorb the load together, and which after hardening of the concrete can be shifted to a new

section to be concreted, with the advancing girder moving across the new section first while supported on the scaffold girder, whereupon the scaffold girder is moved into position above the advancing girder with its front end supported thereon and the rearward end supported on a frame having rollers.

3,571,836
BOAT DOCKING DEVICE
Donald A. Dunlap, 2937 Virginia Ave., Redding, Calif.
Filed Jan. 2, 1969, Ser. No. 788,558
Int. Cl. B65g *11/00*
U.S. Cl. 14—71 **2 Claims**



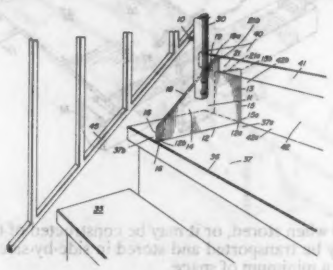
A combined boarding ladder and dock for a small boat is provided by means of a telescoping ladder structure having U-shaped clamps at one end and pivoted spikes at the opposite end. The telescoping ladder structure can be locked in any desired degree of extension and the ladder can be swung horizontally from the boat, using the spike structure to engage the ground, providing a portable dock or the ladder can be swung vertically, providing a boarding ladder for the boat. Auxiliary legs are provided which can be clamped to the ladder to steady the ladder against the boat or which can be used as an intermediate supporting member when the ladder is in a horizontal position.

3,571,837
BACK SCRUBBER
Alexander Earl Weaver, 2207 Snelling Ave. South, Minneapolis, Minn.
Filed May 12, 1969, Ser. No. 823,910
Int. Cl. A47k *7/02*
U.S. Cl. 15—231 **3 Claims**



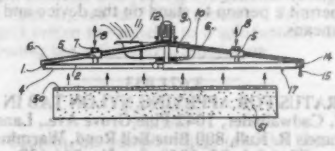
This invention relates to a back scrubber for bathing which is specifically constructed to facilitate quick and easy changing of the scrubbing cloth mounted thereon while providing highly effective means for positively holding the cloth in operative position.

3,571,838
SNOW REMOVAL IMPLEMENT
Melvin P. Staschke, 3630 S. Windchester Ave., Chicago, Ill.
Filed Nov. 19, 1968, Ser. No. 777,085
Int. Cl. E01h *5/02*
U.S. Cl. 15—236 **4 Claims**



An implement for removing snow is arranged having a blade and a handle, the blade in profile presenting a first side portion and a laterally opposite toe second side portion extending for the upper edge of the toe second side portion in the blade profile to be lower than the bottom rail of a stairway when a bottom edge of the blade extending on the aforementioned first side portion and on the toe second side portion is brought extending contiguous to forward and backward ends of a stair step tread surface and a side edge afforded by the first side portion is brought extending contiguous to upper and lower ends of the rise surface of a next upper stair step with having the handle disposed for operating the blade relative to these tread and rise surfaces to remove snow laterally of a stairway and in this eventually bringing the upper edge of the toe second side portion in a raised position of the blade under the bottom rail of the stairway for the blade to remove snow from the latter zone.

3,571,839
APPARATUS FOR REMOVING THE EXCESS MATERIAL OBTAINED WHEN TRIMMING THE TOP SIDE OF PLASTIC FOAM CONCRETE BLOCKS
Wilfried Hartmann, Lindacherueg 15, Emmering near Furstenfeldbruck, Germany, and Josef Vogele, Albrecht-Durer-Strasse 3, Furstenfeldbruck, Germany
Filed Oct. 28, 1968, Ser. No. 770,940
Claims priority, application Germany, Nov. 15, 1967, P 16 83 837.2
Int. Cl. A47l *5/38*
U.S. Cl. 15—303 **7 Claims**

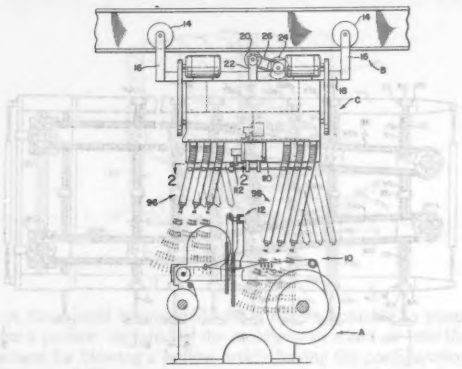


A device for removing the material trimmed from the top side of plastic foam concrete blocks in which a suction box is lowered onto and travels across the concrete block. The suction box has a grid with a plurality of fine openings therein all being connected to a suction fan which generates a negative pressure in the suction box.

3,571,840
CLEANING APPARATUS FOR LOOMS

Hamlin Joseph Gleaton, and Bobby Lee Johnson, Greenville, S.C., assignors to Eaton, Yale & Towne Inc.

Filed July 11, 1968, Ser. No. 744,060
Int. Cl. B08b 5/02
U.S. Cl. 15—312 4 Claims

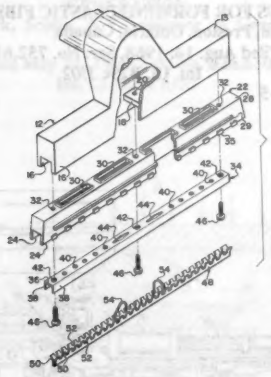


Apparatus for cleaning looms and other textile machinery by the use of rapidly pulsed, high velocity air jets.

3,571,841
WET PICK-UP SUCTION NOZZLE WITH FILTER MEANS

Darwin S. Crouser, North Canton, Ohio, assignor to The Hoover Company, North Canton, Ohio

Filed Apr. 28, 1969, Ser. No. 819,698
Int. Cl. A47l 9/06
U.S. Cl. 15—401 10 Claims

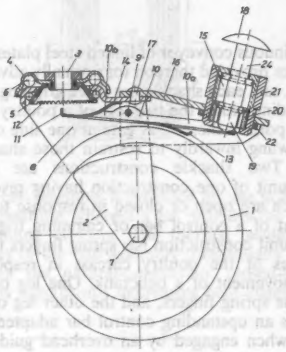


An ambulatory wet pickup suction nozzle has a one-piece elastomeric squeegee member including a pair of parallel lips connected by an apertured web. A rigid retainer bracket positioned between the squeegee lips is removably mounted in the inlet of the nozzle. The squeegee web is trapped between the retainer bracket and fixed mounting means within the mouth inlet. The retainer bracket is generally channel-shaped in cross section, having a planar central web with a plurality of spaced small perforations along its length so as to allow air therethrough to function as a secondary filter. A removable filter bar, functioning as a primary filter, is designed to be removably mounted on the face of the retainer bracket. The filter bar is generally V-shaped in cross section, the base of the V-masking the central web of the retainer bracket. The converging surfaces of the filter bar, forming the V, have castellated outer edges which act in conjunction with the retainer bracket, against which they abut, as perforations forming an easily cleanable primary filter.

3,571,842
RUNNERS PARTICULARLY CASTERS

Dietrich Fricke, Wermelskirchen,Rhineland, Germany, assignor to Tente-Rollen G.m.b.H. & Co., Wermelskirchen-Tente,Rhineland, Germany

Filed Jan. 5, 1968, Ser. No. 695,942
Claims priority, application Germany, Jan. 21, 1967, T33041
Int. Cl. B60b 33/00
U.S. Cl. 16—35 20 Claims

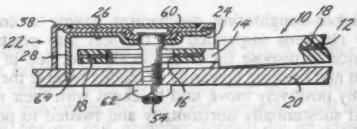


A box runner or caster is provided with a locking device for locking the running and/or swiveling movements of the running wheel. The locking device consists of a pivoted two armed lever having one end shaped to engage in fixed teeth to prevent swiveling and the other end shaped to engage the tyre of the running wheel. The lever is spring biased into the unlocked position and can be moved into its locking position by means of a ball pen press mechanism so that alternate operation of the press mechanism causes locking and unlocking respectively.

3,571,843
HANDLE WITH CONCEALED ATTACHING SCREW

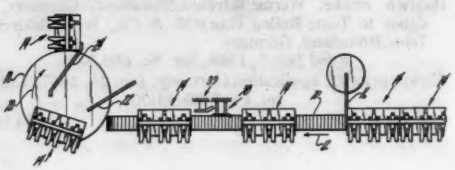
Marton J. Szabo, Broomall, Pa., assignor to Philadelphia Handle Company Inc., Camden, N.J.

Filed July 23, 1969, Ser. No. 844,043
Int. Cl. A47b 95/02
U.S. Cl. 16—115 5 Claims



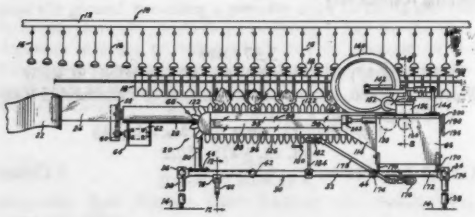
A flexible collapsible handle with hardware to attach the ends to a carrying case wall formed of brackets retained in caps by headed screws adapted to extend through the carrying-case wall and decorative means concealing the headed portions of the screws.

3,571,844
POULTRY CONVEYOR SYSTEM
Philip G. Stiles, Davis, Calif., assignor to The University of Connecticut, Storrs, Conn.
Filed June 4, 1968, Ser. No. 734,455
Int. Cl. A22c 21/00
U.S. Cl. 17—11 7 Claims



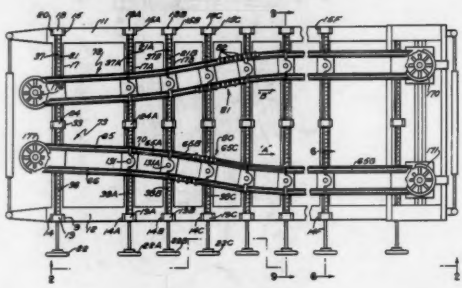
A continuous conveyor of linked steel plates has a plurality of shackles provided thereon for normally advancing with the conveyor, and each shackle has three gripping units for selectively holding either the two legs of a poultry carcass and/or the neck portion thereof. A gate at one side of the conveyor can be swung inwardly to restrain those shackles upstream thereof. Two shackle constructions are disclosed, the gripping unit of one construction having pivotally mounted jaws which are open or closed in response to lateral sliding movement of a control bar or camming trigger. The other gripping unit construction has spring fingers for gripping the extremities of the poultry carcass in response to lateral pivotal movement of a bellcrank. One leg of the bellcrank carries the spring fingers, and the other leg of the bellcrank comprises an upstanding control bar adapted to be pivoted laterally when engaged by an overhead guide bar provided for this purpose.

3,571,845
CHICKEN-SLAUGHTERING MECHANISM
Eugene G. Martin; Roland P. Gehman, Stevens, and Edgar H. Smith, New Holland, Pa., assignors to MGS, Inc., Denver, Pa.
Filed Dec. 4, 1968, Ser. No. 781,232
Int. Cl. A22c 21/00
U.S. Cl. 17—11 34 Claims



Chicken-slaughtering mechanism having a conveyor to move chickens suspended by the feet into position for an operator to dispose the necks in slots formed in propelling means and opening upwardly to readily receive the necks and thereby positively move said chickens with their necks positioned substantially horizontally and twisted to position one side for the jugular vein to be incised to a limited controlled depth by a disc knife, and also including means to engage the opposite side of each neck from that penetrated by the knife to fully position the necks in said slots while a neck-stretching roller engages the necks of the chickens to stretch the same in opposition to the slotted propelling means and thereby dispose the skin of the neck in taut condition for efficient incising of the jugular vein close to the jaw as the neck is moved past the power-driven knife.

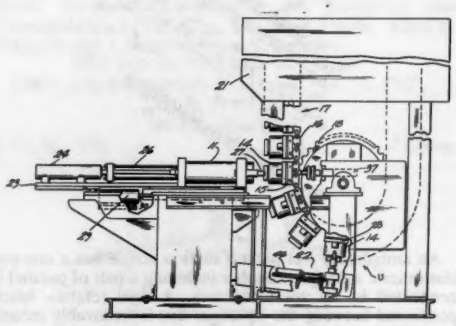
3,571,846
EXPANSION SUPPORT PLATFORM FOR TENTER MACHINE GUIDE RAIL SECTIONS
William Tomlinson, East Providence, R.I., assignor to Bevis Industries, Inc., Providence, R.I.
Filed Jan. 24, 1969, Ser. No. 793,817
Int. Cl. B29g 7/00
U.S. Cl. 18—1 6 Claims



This disclosure relates to a platform for supporting adjacent pivotally connected guide rail section ends which expand and contract due to heating and cooling and also more toward and away from each other under the influence of saddle adjustment.

This invention relates to a platform for supporting the ends of pivotally connected tenter clip guide rail sections as adjustment of the saddle places the ends in angular relationship or as expansion and contraction of adjacent guide rail sections causes the opposite ends thereof to move toward or away from each other.

3,571,847
APPARATUS FOR FORMING PLASTIC FIBER FILTERS
Robert Palmai, Preston, Ontario, Canada
Filed Aug. 14, 1968, Ser. No. 752,611
Int. Cl. B29c 3/02
U.S. Cl. 18—5 6 Claims

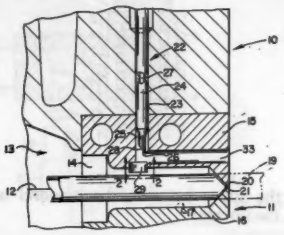


Apparatus for forming plastic fiber filters wherein a formed filter of a dried mat containing uncured resin is transferred to a heated mold and the heated mold is moved in an endless path through a heating chamber to an unloading station.

3,571,848
HIGH EXHAUST NEEDLE

John L. Szajna, Norridge, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed Jan. 14, 1969, Ser. No. 791,034
Int. Cl. B29d 23/03
U.S. Cl. 18—5 5 Claims

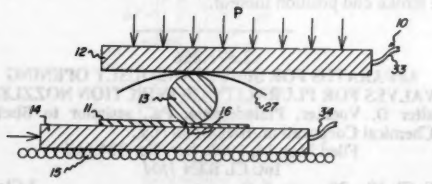


A blow mold is provided with a needle actuable to puncture a parison captured in the mold and to admit air into the parison for blowing a hollow article having the configuration of the mold. The needle is positioned to puncture the parison in a waste portion thereof. The barrel of the needle is substantially larger than the tip, beginning a short distance back of the point, the tip being sized to form a small initial puncture opening in the parison. The needle slides in a bore closely fitting the barrel. When the parison is blown, that portion surrounding the tip of the needle expands along the barrel, enlarging the puncture opening. After the parison is blown and the needle retracted, the air rapidly exhausts from the parison through the enlarged puncture opening, which communicates with atmosphere through a passage intersecting the needle bore.

3,571,849
ROLLING MILL APPARATUS FOR HIGH PRESSURE GENERATION

Robert S. Kirk, Scotia, N.Y., assignor to General Electric Company

Filed May 21, 1969, Ser. No. 826,650
Int. Cl. B29c 6/00
U.S. Cl. 18—5 6 Claims

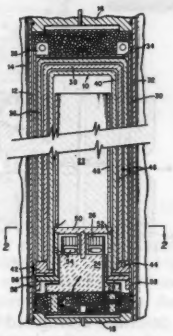


A rolling mill/matrix combination capable of bringing about high pressure, high temperature conversions in a substantially continuous sequence is described. The material being subjected to high pressure is disposed within a series of separate sample containment pockets in a sheet of matrix material and the composite is compressed between a rolling metal element and a flat metal plate forcefully urged toward each other. Means are also set forth for direct heating of the sample material, while high pressure is applied thereto. The synthesis of cubic diamond is exemplary of the high pressures, high temperatures simultaneously attained with this apparatus.

3,571,850
HOT-ISOSTATIC-PRESSING APPARATUS

Herbert A. Pohto, and Carl D. St. Onge, Oak Ridge, Tenn., assignors to the United States of America as represented by the United States Atomic Energy Commission

Filed Apr. 15, 1969, Ser. No. 816,362
Int. Cl. B29c 3/00; B22f 3/14
U.S. Cl. 18—5 8 Claims

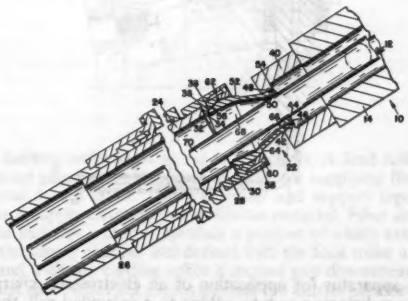


An improved bell assembly is provided for use in a hot-isostatic-pressing apparatus wherein a gas provides the material pressing and heating medium. The thermal insulating and sealing properties of the bell assembly substantially enhance the efficiency of the natural-convection, closed-loop gas heating system by significantly decreasing heat losses and gas escape.

3,571,851
SELF-ALIGNING SEAL TIP FOR SPLICE BOX

Robert W. Ackley, and Edwin L. Jette, Jr., Stonington, Conn., assignors to Crompton & Knowles Corporation, Worcester, Mass.

Filed July 23, 1969, Ser. No. 844,039
Int. Cl. B27f 1/10
U.S. Cl. 18—6 6 Claims

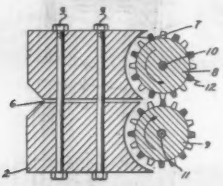


A continuous vulcanizing apparatus in which a splice box forming the entering portion of the vulcanizing chamber has an entering chamber with an inwardly tapering annular wall for receiving one end of the ball joint connector; and an extruder head has an exit chamber formed by an inwardly tapering annular wall for receiving the other end of the ball joint connector. The outer portions of the connector which contact the walls of the exit and entering chambers are spherical to permit relative motion between the connector and extruder head and between the splice box and connector. There is a bore through the connector to permit vulcanizable material to flow through the connector from the exit chamber to the entrance chamber.

3,571,852
APPARATUS FOR FORMING CORRUGATED FOAMED THERMOPLASTIC MATERIALS

John Harold Gilbert, Ashlea, Mynydd Bach, Shire Newton, Chepstow, Monmouthshire, England

Filed Aug. 28, 1967, Ser. No. 663,761
Claims priority, application Great Britain, Aug. 30, 1966, 38556/66
Int. Cl. B29d 7/22
U.S. Cl. 18—12 3 Claims

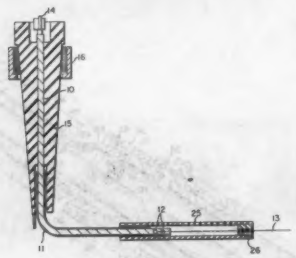


This application describes corrugated foam thermoplastic materials in which each corrugation is itself corrugated. In effect, the thermoplastic materials are corrugated in two directions and generally have a wafflelike appearance. Also described is a process for producing the double corrugated materials and suitable apparatus therefor. The corrugated materials find many uses, for instance, as a carpet underlay.

3,571,853
ELECTROSTATIC PINNING OF EXTRUDED POLYMERIC FILM

Melton Orlander Denton, Victoria, Tex., and Samuel Eddy Meggs, Florence, S.C., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed May 12, 1969, Ser. No. 823,811
Int. Cl. B29d 7/20, 7/02
U.S. Cl. 18—15 4 Claims



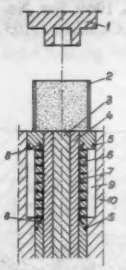
In apparatus for application of an electrostatic charge to cause a dielectric web to adhere to a grounded roll, the improvement comprising movable insulating tubes over the terminal supports and the electrode wire.

3,571,854
MEANS FOR MANUFACTURING PRESSED POWDER BODIES

Hans Lundstrom, Robertsfors, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Dec. 26, 1967, Ser. No. 693,626
Claims priority, application Sweden, Dec. 27, 1966, 17731/66
Int. Cl. B29c 3/00; B30b 11/00
U.S. Cl. 18—16.5 1 Claim

A pressed powder body is formed by introducing powder into a space on the outside of a mandrel and inside a rubber sleeve to the outside of which fluid under pressure is supplied. Punches move downward from above and upward from

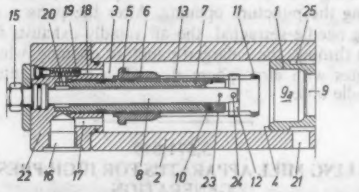


below into the space between the mandrel and sleeve to precompact the powder.

3,571,855
DEVICE FOR STROKE LIMITATION ON HYDRAULICALLY DISPLACED MOLD CARRIER UNITS ON INJECTION MOLDS

Heinz Karl Hofer, Langenholzhausen, and Friedrich Rehmsmeier, Vlotho, Germany, assignors to Stubbe Maschinenfabrik GmbH, Vlotho, Germany

Filed July 3, 1968, Ser. No. 742,384
Int. Cl. B29f 1/00
U.S. Cl. 18—30 8 Claims



A device for limiting the stroke on hydraulically displaced mold-carrier units of injection molding machines, by means of an abutment element which is infinitely variably adjustable relative to a setting or adjusting device arranged in the axial direction of the actuating piston of the mold-carrying unit, and which by cooperation with the actuating piston, limits the stroke end position thereof.

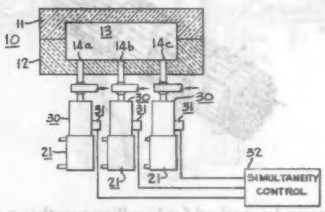
3,571,856
APPARATUS FOR SIMULTANEOUSLY OPENING VALVES FOR PLURALITY OF INJECTION NOZZLES

Walter D. Voelker, Philadelphia, Pa., assignor to Bischoff Chemical Corporation, Hicksville, N.Y.

Filed May 14, 1969, Ser. No. 824,617
Int. Cl. B23f 1/04
U.S. Cl. 18—30 3 Claims

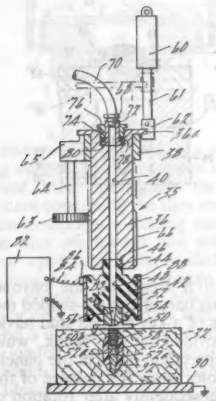
Giant articles of cellular plastic are molded in injection molding apparatus. Each of a plurality of injection nozzles comprises a bore in which an injection plunger reciprocates between a withdrawn position at which the tip of the injection plunger rests during the brief mold-filling step and an advanced position at which the tip rests during much of the prolonged step of cooling the molded article. As the plunger advances from its withdrawn position, it first acts as a valve to discontinue flow of the plastic into the nozzle bore and then during a principal portion of its advancing stroke, the injection plunger purges the residual cellular plastic between an inlet orifice and the nozzle tip and forces it into the mold. Only in the final stages of the withdrawing stroke does the tip of the injection plunger expose the inlet orifice to open the

valve to renew the flow of cellular plastic to the mold. Power means such as a hydraulic cylinder for each injection plunger actuates the reciprocation. The improvement concerns means provided to each injection plunger as soon as it had completed a selected major amount of its withdrawing stroke so that it is temporarily braked at a position near the brink of valve-opening position. Sensors detect and provide signals while an injection plunger is thus braked at a brink of opening position. A simultaneity control system detects the signals



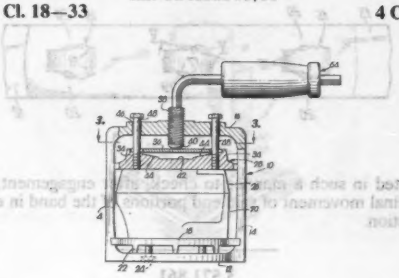
and responds as soon as the signals establish that every injection plunger is at such brink of opening position, and then simultaneously releases the brake for each and all of the injection plungers, which then move to the fully withdrawn positions, thereby simultaneously opening all of the valves. More reproducible articles are molded when the plurality of nozzles are reliably opened with improved simultaneity than when the injection plungers withdrawn by the plurality of hydraulic cylinders by a single stage movement.

3,571,857
FASTENING APPARATUS
Jeff S. Rhyne, Box 640, Marianna, Fla., Division of Ser. No. 602,663, Dec. 19, 1966, Pat. No. 3,492,381.
Filed Aug. 14, 1969, Ser. No. 850,159
Int. Cl. B29d *1/00*
U.S. Cl. 18—30 **3 Claims**



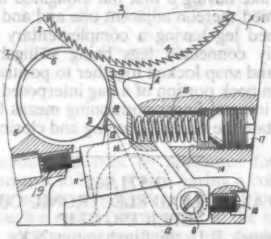
An apparatus for attaching various objects to a board member formed of a loose, porous material incapable of retaining screws, bolts or the like, whereby an adhesive in liquid form is injected into the board member to locally displace the internal matrix of the board and form an island or mass of adhesive within the board which mass, after setting, will receive and retain screws, bolts etc. and thereby allow the same to be used to attach various objects to the board. The injector apparatus is simultaneously rotatable and axially movable and advances a hollow needle to provide a settable material into the matrix of the board.

3,571,858
FLAT SPRING DENTAL COMPRESS
George F. McGowan, 4509 Forest, Kansus City, Mo.
Filed Oct. 2, 1968, Ser. No. 764,556
Int. Cl. A61c *13/00*
U.S. Cl. 18—33 **4 Claims**



A curing clamp for a dental flask employs a flask-engaging pressure plate provided with a pair of spaced pillars upon which a flat bar of spring steel rests. Force is applied to the plate by a center screw that engages the spring bar and is centered with respect to the pillars.

3,571,859
FIBER-PROCESSING APPARATUS
Ctibor Doudlebsky; Stanislav Kabele; Zdenek Svec; Marketa Reymanova, and Stanislav Didek, Usti nad Orlici, Czechoslovakia, assignors to Vyzkumny Ustav Barlnarsky, Usti nad Orlici, Czechoslovakia
Filed Apr. 11, 1969, Ser. No. 815,405
Claims priority, application Czechoslovakia, Apr. 16, 1968, PV2775-68
Int. Cl. D01g *15/40*
U.S. Cl. 19—105 **6 Claims**



A carding roller is mounted in a support. A feed roller is mounted proximal to the carding roller for supplying fibrous material to the latter. The feed roller and support together define a supply channel for the fibrous material. Fiber supply means includes a carrier member a portion of which extends into the supply channel and defines with the feed roller a first gap and with the carding roller a second gap downstream of the first gap. Adjusting means mounts the carrier member for multidirectional movements so that its aforementioned portion will change position in a sense varying at least the dimensions of at least the second gap.

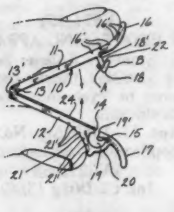
3,571,860
STRAPPING STRIP
Harald Timmerbeil, Schwelm, Germany, assignor to Titan Eisenwarenfabrik G.m.b.H., Schwelm, Germany
Filed Sept. 10, 1968, Ser. No. 758,803
Claims priority, application Germany, Sept. 7, 1967, P 15 86 961.1
Int. Cl. B65d *63/02*
U.S. Cl. 24—20 **2 Claims**

A strapping band for packages and the like is provided at overlapping end portions with lock means formed by at least

two fastening catches each comprising webs bent out of the plane of the band from between pairs of longitudinally extending stepped slots. At least one of the lock means is con-

structed in such a manner to check, after engagement, longitudinal movement of said end portions of the band in either direction.

3,571,861
BAG CLOSURE MEANS
Earle L. Olson, Greendale, Wis., assignor to Famco Inc., Menomonee Falls, Wis.
Filed Nov. 26, 1968, Ser. No. 778,983
Int. Cl. B65d *63/00*
U.S. Cl. 24—30.5 **8 Claims**

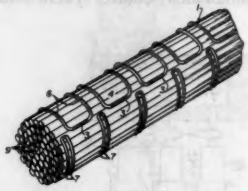


A one-piece molded resilient plastic clip for sealing food bags or the like having a first flat elongated leg with a snap element formed thereon adjacent one end and a second, hingedly attached leg having a complementary snap element, said hingedly connected legs being swingable over upon themselves and snap locked together to positively clampingly seal the open neck portion of a bag interposed therebetween, there being integral finger-positioning means formed on said clip to facilitate the manual opening and closing of the same.

3,571,862
BELTED AXIAL LEAD ELECTRONIC COMPONENT SPLICING CLIP
Albert W. Zemek, R.D. #6, Binghamton, N.Y.
Filed Dec. 20, 1968, Ser. No. 785,583
Int. Cl. F16q *3/00*
U.S. Cl. 24—36 **6 Claims**

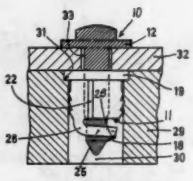
A splicing clip for attaching two ends of tape of belted equally spaced axial lead electronic components, the clip including a base with upstanding bendable slide clasp portions of generally triangular configuration in direct juxtaposition on two sides of said base and separated on the sides of the base by a distance substantially equal to the diameter of the axial lead. The ends of the tapes are placed on the base with at least the last two axial leads on each end of each tape resting in the separations between the clasps and thereafter the clasps are bent over the surface of the tape not in contact with the base.

3,571,863
WIRE FORM FOR BUNDLING WIRES
Maurus C. Logan, Elizabeth, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.
Filed Apr. 16, 1969, Ser. No. 816,672
Int. Cl. A44b *21/00*; **H02g** *3/00*
U.S. Cl. 24—123 **2 Claims**



A means and a method for bundling together a plurality of cylindrical members wherein a preformed continuous wire-supporting member of generally open trough shape is caused to embrace a bundle of cylindrical members by urging together the sides of the supporting member. A protective layer may also be included within or without the supporting member to provide environment protection for the cylindrical members within. Alternatively, a separate member may be employed to complete the enclosure of the cylindrical members without urging together the sides of the supporting member.

3,571,864
FASTENER
Rene Emile Henri Oger, St. Cloud, France, assignor to U. S. Philips Corporation, New York, N.Y.
Filed May 12, 1969, Ser. No. 823,690
Claims priority, application France, May 27, 1968, 153058
Int. Cl. A44b *17/00*
U.S. Cl. 24—221 **5 Claims**

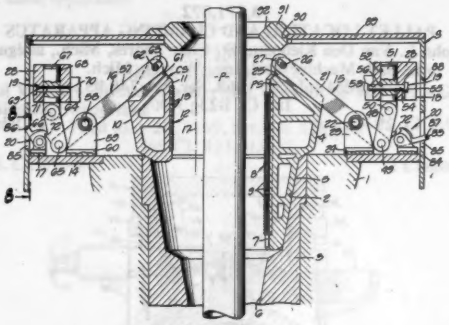


A device which is based on the bayonet principle for fastening an at least partially panel-shaped member to a fixed member by means of a key-shaped stud having a lateral projection or bit provided on the shank, which stud can be passed through subsequent holes in the panel and in the fixed member, which holes allow the passage of the shank and the projection, and subsequently after rotation of the shank the projection can engage in a recess in a resilient element of the fixed member so that withdrawal of the stud is prevented.

3,571,865
POWER DRILL PIPE AND DRILL COLLAR SPIDER
Noal E. Johnson, Humble, Tex., assignor to Byron Jackson Inc., Long Beach, Calif.
Filed Oct. 6, 1969, Ser. No. 863,777
Int. Cl. E21b *3/04*
U.S. Cl. 24—263 **12 Claims**

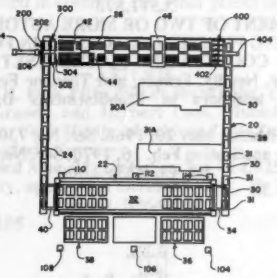
Power drill pipe and drill collar spider apparatus in which drill pipe slip elements and drill collar slip elements are selectively connectable to an actuator ring, the actuator ring being

movable between positions at which either the drill pipe slip elements or the drill collar slip elements are disposed in the



slip bowl or are retracted from the slip bowl, while the other of the slip elements are latched in retracted positions.

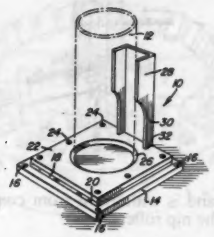
3,571,866
SYSTEM FOR AUTOMATICALLY HANDLING SETTERS FILLED WITH CERAMIC TILE
John J. Brown, Jr., Siler City, N.C., assignor to Forrest Paschal Machinery Company, Siler City, N.C.
Filed Apr. 15, 1969, Ser. No. 816,243
Int. Cl. B65g *47/52, 60/00*
U.S. Cl. 25—2 **15 Claims**



The present invention is directed to a system for continuously processing unfired, glazed or green ceramic tile during the curing thereof. More specifically, the system automatically handles setters containing the tiles and according to the present invention comprises a loading station where freshly painted ceramic tiles are loaded into setters or saggers, a loading conveyor upon which the loaded setters originally embark, a load/unload transfer carriage which simultaneously transfers a course of setters loaded with green tiles from the conveyor onto a first, empty kiln car for transportation to a kiln and a course of setters loaded with fired tiles from a second, loaded kiln car back onto said conveyor, a flipover device which tilts the setters to a horizontal position, whereupon the tiles slide out by gravity, and a setter-turning device which returns the setters to their original upright position on the conveyor belt. The aforementioned elements are integrated into a closed loop system operated by a series of limit switches and photoelectric cells.

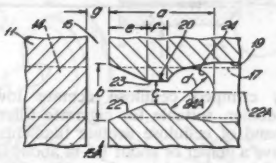
3,571,867
CONCRETE CYLINDER CAPPER
John V. Cooke, New Orleans, La., assignor to Cecil M. Shilstone and Associates, Inc., a fractional part interest to each
Filed Jan. 28, 1969, Ser. No. 794,656
Int. Cl. B28b *7/00*
U.S. Cl. 25—118 **5 Claims**

A concrete capper used in preparing a concrete test sample comprising a jiglike device for insuring the formation of a substantially planar end on the prepared sample. The jig in-



cludes a removable glass plate which permits a user to simply replace the glass plate when necessary at a small expense.

3,571,868
APPARATUS FOR INTERLACING CONTINUOUS FILAMENTS
Michel Buzano, Villeurbanne, (Rhone), France, assignor to Societe Rhodiaceta, Paris, France
Filed Nov. 29, 1968, Ser. No. 779,781
Claims priority, application France, Nov. 30, 1967, 130,393
Int. Cl. D02g *3/00*
U.S. Cl. 28—1.4 **7 Claims**

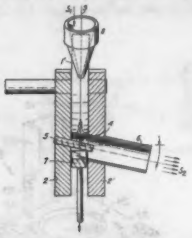


The specification discloses an apparatus for interlacing continuous filaments to form a yarn having a coherent structure, due to the action of at least one high velocity fluid jet. Extending through a main body member of the apparatus is a keyhole cross section passage having a cylindrical portion through which the filaments run, and an isosceles trapezoidal cross section prismatic portion into which the fluid jet is symmetrically projected.

3,571,869
STUFFING-BOX DEVICE FOR CRIMPING FILAMENTARY MATERIAL
Miloslav Pavek, and Miroslav Novacek, Liberec, Czechoslovakia, assignors to Elitex, Zavody Textilniho Strojirenstvi Generalni Reditelstvi, Liberec, Czechoslovakia
Filed Sept. 18, 1969, Ser. No. 860,166
Claims priority, application Czechoslovakia, Sept. 21, 1968, PV 6621—68
Int. Cl. D02g *1/12*
U.S. Cl. 28—1.6 **10 Claims**

A pair of nip rollers cooperate with one another for feeding filamentary material in a predetermined direction. They define with one another immediately downstream of the nip a free space having two opposite open sides. Wall means is arranged adjacent to and closing the opposite open sides but is out of contact with the nip rollers, defining with the same a crimping chamber. A skewed crimping member is mounted on the wall means extending across the chamber in the path of the filamentary material. A doctor blade is arranged downstream of the crimping member mounted for movement

between an active and an inactive position in which it respectively contacts and is withdrawn from contact with the circumference of the nip rollers.



3,571,870

PROCESS FOR THE PRODUCTION OF CRIMPED TOW FOR CIGARETTE FILTERS

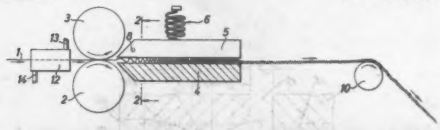
Olaf George Dixon, deceased, late of Leamington Spa, England; Margaret Patricia Dixon, Personal Representative, Leamington Spa, and John Fagge, Huberston, Cleepthorpes, England, assignors to Courtaulds Limited, London, England

Continuation-in-part of application Ser. No. 568,748, July 29, 1916. This application Mar. 14, 1969, Ser. No. 807,455

Claims priority, application Great Britain, Aug. 5, 1965, 33,496/65

Int. Cl. D02q *1/12*

U.S. Cl. 28—72.14 **6 Claims**



Vertically crimped cellulose acetate tow of 25,000—100,000 denier, suitable for cigarette filters, is made by feeding a band of cellulose acetate filaments in which the filaments have a denier of about 1.5 to about 10, are substantially parallel to one another and are adhered to one another, the band being not more than about 6 filament diameters thick, to a stuffing box crimper having an opening wide enough to accommodate the tow and not more than three-sixteenths inches high.

3,571,871

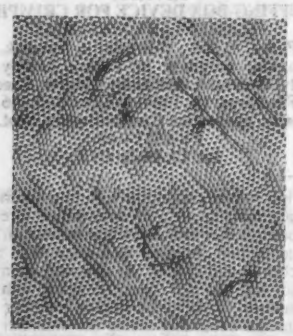
METHOD OF TREATING FIBROUS GLASS FABRICS

Remus F. Caroselli, Cumberland; James J. Dillon, Providence, and David E. Leary, Cumberland, R.I., assignors to Owens-Corning Fiberglas Corporation

Filed Sept. 8, 1966, Ser. No. 578,430

Int. Cl. D06p *3/80*

U.S. Cl. 28—74 **11 Claims**



Methods for imparting decorative weave effects and designs to fibrous glass fabrics in post-weaving operations particularly comprising the transformation of stresses existing in a given weave design to yield a uniform weave pattern are provided.

3,571,872

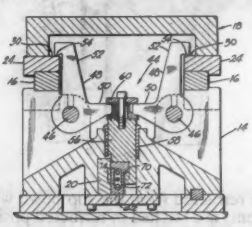
PALLET LOCATING AND CLAMPING APPARATUS

John L. Van Den Kieboom, St. Clair Shores, Mich., assignor to La Salle Machine Tool, Inc., Warren, Mich.

Filed July 30, 1968, Ser. No. 748,852

Int. Cl. B23g *3/00*

U.S. Cl. 29—1 **11 Claims**



Apparatus for supporting and transferring workpieces for successive machine operations, including rails on which a series of pallets adapted to support the workpieces can be positioned. A fixture adapted to be mounted adjacent to a machine tool is provided for locating a pallet and subsequently for clamping the pallet to their rails at such location. A single actuator bar is provided for actuating the locating and clamping elements of the fixture.

3,571,873

ARRANGEMENT OF TWO OR MORE AUTOMATICALLY OPERATING PUNCHING MACHINES IN FORM OF A COOPERATING MACHINE SET

Roger Muller, Neuilly, France, and Theodor Fenner, Neuilly, Germany, assignors to Etablissements D.F., Gentilly, France

Original application May 20, 1968, Ser. No. 730,277. Divided and this application Feb. 16, 1970, Ser. No. 011,666

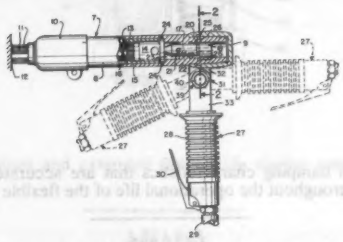
Int. Cl. B23p *23/00*

U.S. Cl. 29—38 **1 Claim**

An arrangement of at least two automatically operated stamping machines in the style of a cooperating machine set, which comprises a plurality of stamping machines disposed in one line and spaced apart equally from each other. A plurality of sheet supporting tables is disposed at a unitary level and a rotatable table is releasably inserted between each pair of adjacent of the stamping machines. The transfer tables connect a workpiece depositing station of each of the machines with a feeding station of the next following of the machines. The stamping machines comprise notching presses for the production of dynamo sheets for electromachines and

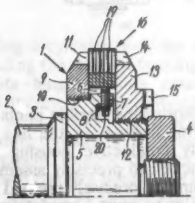
disposed in series, and a separating press is disposed at the end of the row of the machines, the separating press dislocating said sheets combined during the passage of the preset notching presses into stator- and rotor-sheets and depositing the same separately.

3,571,874
DESCALING DEVICE
Paul Von Arz, Sissach, Switzerland, assignor to Von Arz AG, Sissach, Switzerland
Filed May 28, 1969, Ser. No. 828,514
Int. Cl. B21c *43/00*
U.S. Cl. 29—81 **2 Claims**



A descaling, derusting, deslagging or metal cleaning device of the compressed air gun type which is supplied with compressed air through its handle and such handle is pivotally mounted on the device and capable of being swung not only into the usual positions but also into a position at a small angle to the barrel assembly of the device so as to enable the device to be used in confined and other places of difficult access.

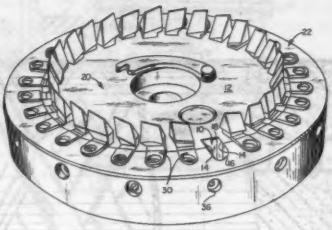
3,571,875
WORK TOOL FOR PRECISION WORKING OF GEARS
Gianfranco Grandi, and Herbert Loos, Munich, Germany, assignors to Carl Hurth Maschinen-Und Zahnradfabrik, Munich, Postfach, Germany
Filed Mar. 21, 1968, Ser. No. 714,925
Claims priority, application Germany, Mar. 23, 1967, H62239
Int. Cl. B26d *1/12*
U.S. Cl. 29—105 **7 Claims**



A spur or helical gearlike or racklike work tool for precision working of gears wherein the work tool has a plurality of cutter teeth adjustably and removably securable to a base member so that the cutter teeth can be exchanged and adjusted.

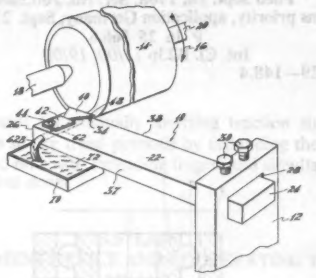
3,571,876
MEANS FOR MOUNTING BLADES IN A CUTTER
Richard C. Blakesley, Holcomb, N.Y., assignor to The Gleason Works, Rochester, N.Y.
Filed Oct. 21, 1968, Ser. No. 769,274
Int. Cl. B26d *1/00*
U.S. Cl. 29—105 **8 Claims**

A face mill cutter is provided with a plurality of completely enclosed slots formed into one face of the cutter to receive cutter blades and clamping means. Each slot has parallel sidewalls and a radially inward bottom wall which is perpendicular to the parallel sidewalls, and a wedge block and



clamping block are used in combination to apply radial forces to a cutter blade inserted in a slot. The radial forces are applied by moving the clamping means axially into the slot.

3,571,877
COOLING SYSTEM FOR CUTTING TOOL AND THE LIKE
Ronald D. Zerkle, Cincinnati, Ohio, assignor to Neal P. Jefferies, Cincinnati, Ohio, fractional part interest.
Filed Apr. 4, 1968, Ser. No. 718,772
Int. Cl. B26d *1/00*
U.S. Cl. 29—106 **8 Claims**

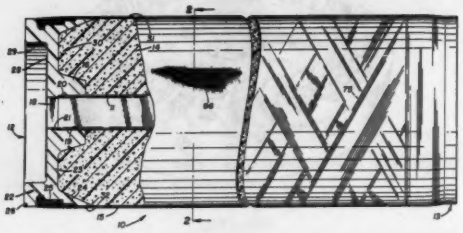


A cutting tool cooling system including a cutting tool having an external cutting edge and an internal cavity with a heat receiving surface in heat exchange and fluid sealed relationship to the cutting edge, and a coolant in the cavity vaporizable at the cavity heat receiving surface for extracting heat therefrom and thereby cooling the tool cutting edge.

3,571,878
INDUSTRIAL ROLLS
Sterling W. Alderfer, Akron, Ohio, assignor to Teledyne, Inc., Los Angeles, Calif.
Filed July 1, 1968, Ser. No. 741,727
Int. Cl. B21b *31/08;* **B75h** *75/02*
U.S. Cl. 29—132 **10 Claims**

The improved industrial roll has axially spaced, preferably elastomeric, cylindrical head members with a beam extending therebetween. A core, preferably of rigid urethane foam, extends cylindrically between the head members and encases the beam. The head members and core are, in turn, encased within a skin that is preferably a filled polyester resin, the skin being locked to the head members. A coupling may be utilized to assist with torsional load transfer between the beam and each head member, and blades may be used to transfer such loads between the beam and the core. To make such a roll, the head members are positioned at the ends of a beam and a core is molded around the beam and between the

head members. The resulting skeletal roll is then provided with the skin that locks the head members to the core. The apparatus for applying the skin comprises a winder for wrapping a ribbonlike skin component helically about the

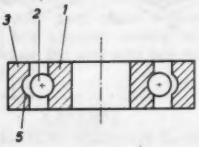


skeletal roll. Sufficient wraps are made completely to encase the core, and a drive mechanism employing a lost motion connection wraps additional lengths of ribbon into a lock groove in each head member to join the components together in an integral roll.

3,571,879
METHOD FOR MANUFACTURING ROLLING TYPE BEARINGS

Josef Kleinhenz; Franz Muller; Hans Kober, and Burkhard Treutlein, Schweinfurt, Germany, assignors to Kugelfischer George Schafer & Company, Schweinfurt, Germany

Filed Sept. 18, 1968, Ser. No. 760,588
Claims priority, application Germany, Sept. 21, 1967, P 16 25 566.6
Int. Cl. B23p *11/00, 19/00*
U.S. Cl. 29—148.4 **7 Claims**



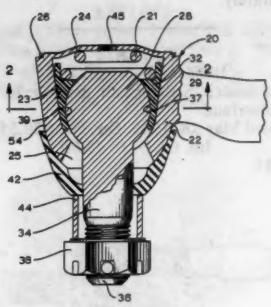
The invention is directed to a method for assembling the inner and outer races of ball or roller type bearings by plastic deformation whereby the maximum number of rolling elements may be mounted within the trackway between the races and whereby an exact and predetermined clearance is obtained in spite of the elastic recovery of the plastically deformed races and whereby either the rolling element size or the trackway shoulders may be increased to a maximum in order to increase the axial loading capacity of the bearing.

3,571,880
METHOD OF ASSEMBLING PIVOT JOINTS

John R. Andrew, Columbus, Ohio, assignor to The Columbus Auto Parts Company, Columbus, Ohio

Filed Apr. 7, 1969, Ser. No. 814,081
Int. Cl. B23p *11/00*
U.S. Cl. 29—149.5 **8 Claims**

A method of fabricating flexible joints such as are used in automotive-steering linkages or the like wherein upper and lower electrically conductive housing portions are fused together at a junction to accurately preload internal seat means in a precisely controlled manner so as to exert a predetermined force upon a pivotal head member within the joint and thereby achieve uniform torque transmitting and

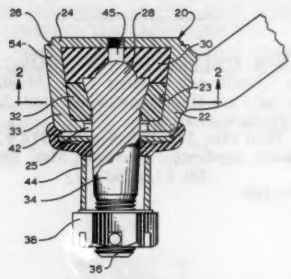


vibration damping characteristics that are accurately maintained throughout the operational life of the flexible joint.

3,571,881
METHOD OF ASSEMBLING PIVOT JOINTS

John R. Andrew, Columbus, Ohio, assignor to The Columbus Auto Parts Company, Columbus, Ohio

Filed Apr. 7, 1969, Ser. No. 814,080
Int. Cl. B23p *11/00*
U.S. Cl. 29—149.5 **9 Claims**



A method of fabricating flexible joints such as are used in automotive-steering linkages or the like wherein upper and lower electrically conductive housing portions are fused together at a junction to precisely assemble the components of the flexible joints to precisely preload deformable internal seat members so as to exert a predetermined force upon an internal pivotal head member within the joint and thereby achieve uniform torque transmitting and vibration damping characteristics that are accurately maintained throughout the operational life of the flexible joint.

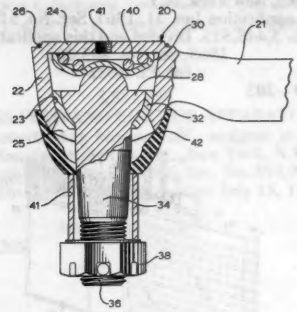
3,571,882
METHOD OF ASSEMBLING PIVOT JOINTS

John R. Andrew, Columbus, Ohio, assignor to The Columbus Auto Parts Company, Columbus, Ohio

Filed Apr. 7, 1969, Ser. No. 814,079
Int. Cl. B23p *11/00*
U.S. Cl. 29—149.5 **7 Claims**

A method of fabricating flexible joints such as are used in automotive-steering linkages or the like wherein upper and lower electrically conductive housing portions are fused together at a junction such that the space between the inner housing surfaces is substantially equal to the stacked dimen-

sions of the internal elements of the joints. The resulting swivel joints are characterized by precisely controlled swivel



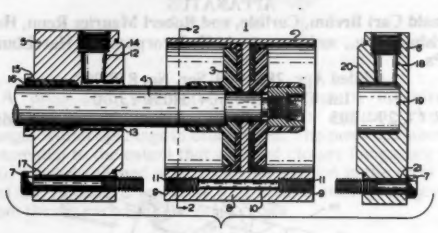
torque values and extended fatigue life during operational use.

3,571,883

METHOD OF MAKING A FLUID OPERATED CYLINDER DEVICE

Charles Doolittle, Lexington, Ky., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Original application Apr. 19, 1966, Ser. No. 543,618, now abandoned. Divided and this application Apr. 19, 1968, Ser. No. 729,867
Int. Cl. B23p *15/00*
U.S. Cl. 29—156.4 5 Claims



A method of making a cylinder body for a fluid operated cylinder device including the steps of forming a tubular body member of indefinite length having externally disposed thereon and integral therewith a plurality of ribs extending longitudinally of the body member, each of said ribs including a coaxially extending through bore, severing from the tubular member a segment thereof of desired length, and tapping the ends of each through bore in the tubular segment to adapt the tubular segment to receive therein head screws for attaching a cylinder head to each end of the tubular portion.

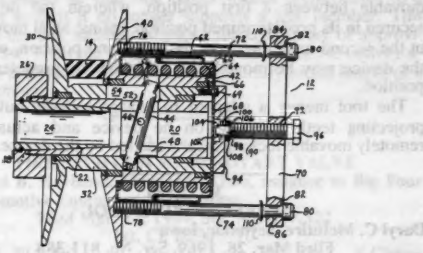
3,571,884

SHEAVE FLANGE OPENING DEVICE

Jackson Chung, Mishawaka, Ind., assignor to Reliance Electric Company

Filed Oct. 3, 1968, Ser. No. 764,726
Int. Cl. B23p *19/00*; B23b *19/04*
U.S. Cl. 29—200 12 Claims

A device for opening the flanges of a variable pitch sheave having two axially movable flanges urged toward one another by a spring means. The device, consisting of a screw-operated mechanism, may be mounted on and removed from the sheave, and is operable to apply pressure to the opposing flanges in the direction to open the flanges and to hold the flanges in open position while the sheave is being assembled on a shaft and a belt is being mounted and positioned on the sheave. After the installation of the sheave has been



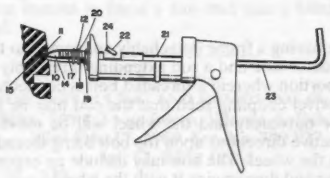
completed, the device is removed from the sheave, which thereafter operates in the normal manner.

3,571,885

TRACTION STUD APPLICATOR

John L. McGrath, 2020 Braun Drive, Golden, Colo.

Filed Nov. 8, 1968, Ser. No. 774,357
Int. Cl. B23p *19/04*
U.S. Cl. 29—200 15 Claims



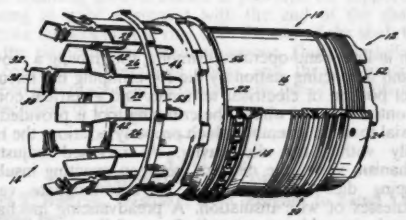
An applicator for manually inserting traction studs into molded holes in tire tread portions by distending the diameter of the stud hole with extending fingers and simultaneously forcing the stud down.

3,571,886

ATTACHMENT DEVICE AND COOPERATING TOOL MEANS

Robert J. Corsmeier, Cincinnati, Ohio, assignor to General Electric Company

Filed May 27, 1969, Ser. No. 828,272
Int. Cl. B23p *19/04*; F16c *43/00*
U.S. Cl. 29—200 16 Claims



An attachment device, for removably securing shaft components to a shaft, is disclosed together with cooperating tool means for use in attaching and removing the device at and from an inaccessible, predetermined position along the shaft. The attachment device includes means for preventing rotation thereof when properly located along the shaft, means for

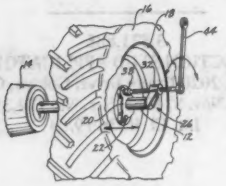
automatically positioning the device at the predetermined position along the shaft and preventing axial movement from that position in a first axial direction, and means remotely movable between a first position, wherein the device is secured in its predetermined position against axial movement in the second axial direction, and a second position, wherein the device may be moved into and from its predetermined position.

The tool means is adapted to engage radially outwardly projecting teeth provided on he device and actuate the remotely movable locking means carried by the device.

3,571,887
WHEEL MOVING TOOL

Daryl C. McIntire, Seymour, Iowa

Filed Mar. 28, 1969, Ser. No. 811,358
Int. Cl. B23p *19/00*
.S. Cl. 29—200 **7 Claims**

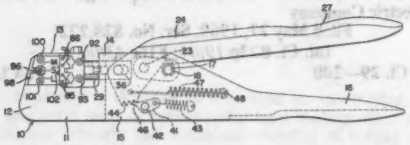


A device having a frame detachably connected to the outer end of a tractor axle and a rod extending threadably through a support portion wherein a threaded bolt is connected to the rod by a swivel coupling such that the rod may be threaded inwardly or outwardly and the wheel will be moved in the same respective directions upon the bolt being threadably engaged with the wheel. The bolt may include an exposed head for engaging and disengaging it with the wheel.

3,571,888
IN-LINE HAND CRIMPING TOOL

Vincent P. Di Filippo, Parma, Ohio, assignor to ETC Incorporated, Cleveland, Ohio

Filed May 8, 1968, Ser. No. 727,479
Int. Cl. H01r *43/04;* **B21d** *43/02*
U.S. Cl. 29—203 **1 Claim**

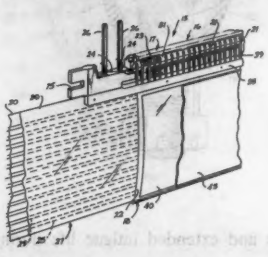


An in-line, hand-operated crimping tool having a movable die and a coacting stationary die for crimping the ferrule or barrel portion of electrical terminals and electrical connectors onto electrical wires. The crimping tool is provided with an axial locating assembly which properly positions the barrel axially within the die cavity. A recessed adjustment mechanism varies the distance between coacting insulation crimping dies to allow them to accommodate various thicknesses of wire insulation. A preadvancing mechanism biases the movable crimping die from a fully opened position to a preadvanced position. In the preadvanced position the distance between the faces of the movable and stationary dies is less than the outside diameter of the barrel in order to secure the barrel in the die cavity prior to the crimping operation. After crimping, the movable die may be fully opened against the bias of the preadvancing mechanism to permit removal of the connector or terminal from the die.

3,571,889
APPARATUS FOR ASSEMBLING A NON-DESTRUCTIVE READ-OUT MEMORY

Joseph W. Fagerstrom, Johnstown, and William C. Kent, Gahanna, Ohio, assignors to Western Electric Company, Incorporated, New York, N.Y.

Original application Jan. 31, 1967, Ser. No. 612,896, now Patent No. 3,448,515. Divided and this application Dec. 12, 1968, Ser. No. 805,061
Int. Cl. H01r
U.S. Cl. 29—203 **7 Claims**

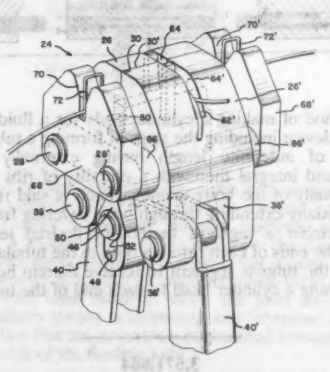


An apparatus including vacuum chuck elements for holding tautly a continuous length of a multiconductor information storage-sensing cable and for holding apart opposite sides of a folded section of a multiconductor access cable while the folded section is moved over and secured to adhesive surfaces of the tautly held information storage-sensing cable.

3,571,890
WIRE-TRIMMING AND CONNECTOR-CRIMPING APPARATUS

Ronald Carl Brehm, Carlisle, and Robert Maurice Renn, Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 28, 1969, Ser. No. 819,907
Int. Cl. H01r *43/04;* **H05k** *13/00*
U.S. Cl. 29—203 **11 Claims**



Apparatus for trimming the ends of wires and crimping an open U-type electrical connector onto the trimmed ends comprises a die and anvil which are movable relatively towards and away from each other to crimp the connector. The die is divided into two sections along a plane extending parallel to its axis and medially therethrough, the two sections being movable transversely with respect to the die axis from an open position to a closed position. Transversely extending slots extend inwardly from the opposed sides of the die sections and cutter bars are mounted on the anvil which are adapted to enter these slots. In use, connector is posi-

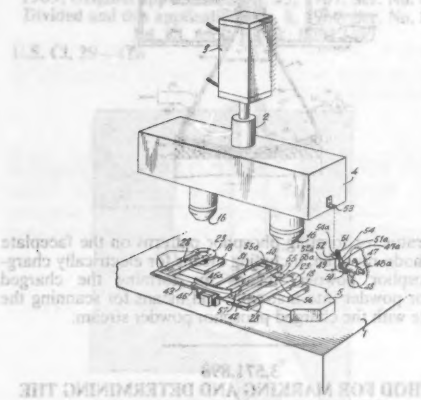
tioned on the anvil and wires are positioned between the die sections when the die sections are in their open positions with the ends of the wires extending transversely through one or both of the slots. The die sections are then moved towards each other and the cutter bars move into the slots to trim the wire ends. Upon subsequent movement of the anvil towards the die, the connector is crimped onto the trimmed wire ends.

3,571,891

PRESS FEED AND EJECTOR APPARATUS

Seward M. Roberts, San Mateo, Calif., assignor to American Flange & Manufacturing Co., Inc., New York, N.Y.

Original application Oct. 31, 1966, Ser. No. 590,993, now abandoned. Divided and this application July 15, 1969, Ser. No. 860,451
Int. Cl. B23p *19/04*
U.S. Cl. 29—208 4 Claims



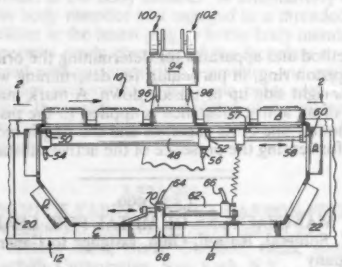
A press feed and ejector mechanism is operatively mounted in conjunction with a die for securing closure flanges within openings in drum heads. The press operation is automated to the extent that a pair of closure flanges are fed into properly aligned work receiving position in the press die and the finished drum head with flanges inserted is ejected from the die each time the press cycles.

3,571,892

CONVEYOR SYSTEM

Marvin Levy, Philadelphia, Pa., assignor to Majestic-Penn State, Inc., Philadelphia, Pa.

Filed Jan. 8, 1969, Ser. No. 789,858
Int. Cl. B65g *23/42*
U.S. Cl. 29—208 8 Claims



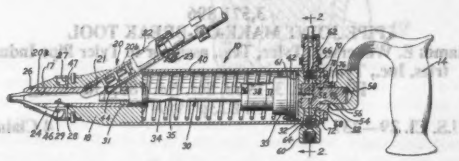
A conveyor system, particularly for riveting binders, having an endless conveyor comprised of rigid link members pivotably connected together and caused to intermittently move by fluid motor means having reciprocal members. Two such motor means are operated sequentially in a predetermined manner so that one motor means reciprocates to a position so that it no longer supports a link member. This permits the link member to rotate through an arc of approximately 90° Then the other motor means moves the conveyor through a distance corresponding generally to the length of a link member.

3,571,893

TIRE STUD GUN WITH ROTARY VALVE

Gaylord B. Haviland, Maineville, Ohio, assignor to Big Four Automotive Equipment Corporation

Filed Mar. 14, 1969, Ser. No. 807,322
Int. Cl. B23q *7/10*
U.S. Cl. 29—212 6 Claims



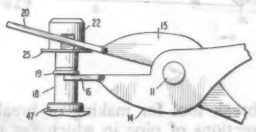
A tire stud gun having a rotary valve thereon at one end of the housing actuated by the handle for selectively actuating the piston therein to force a tire stud into a blind bore in a tire tread.

3,571,894

TOOL FOR INSTALLING AND REMOVING SNAP RINGS

Stanley Bilka, 109 1/2 Van Buren, Winner, S. Dak.

Filed Feb. 17, 1969, Ser. No. 799,827
Int. Cl. B23p *19/08*
U.S. Cl. 29—229 9 Claims



A plier-type tool for removing and installing a snap ring and retainer on the Bendix drive shaft of an automobile starter. One jaw of the tool has an elongated open-ended slot formed therein to fit radially over the shaft and engage the snapring, and the other jaw has an elongated slot with means for engaging the end of the shaft to provide a reaction for applying axial pressure to the ring to force it out of the conventional retaining groove. Means is provided for supporting a snapring in axial alignment with the end of the shaft to facilitate telescoping the ring onto the end of the shaft to install the ring onto the retaining groove. During installation, the conventional retaining collar and thrust washer are snapped into place over the snapring by use of the slots in the opposed jaws of the tool.

3,571,895

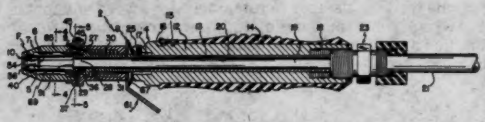
ASSEMBLY TOOL DEVICE

Albert T. Buttriss, Westlake, Ohio, assignor to Eaton Yale & Towne Inc.

Filed May 31, 1968, Ser. No. 733,569
Int. Cl. B23p *19/02*
U.S. Cl. 29—235 20 Claims

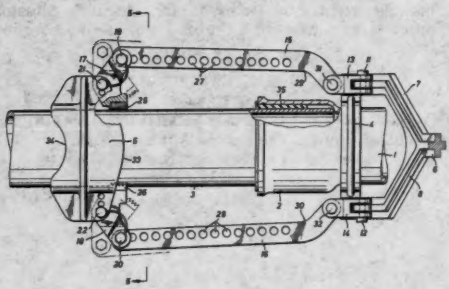
A pneumatic assembly tool device for the semiautomatic insertion of deformable-type fasteners into an apertured workpiece having a hollow housing adapted to receive and transmit fasteners from one end to a reciprocal nozzle

mechanism at the other end. The nozzle mechanism includes a plurality of pivotal interior jawlike members operable to engageably position and hold a fastener in aligned relation



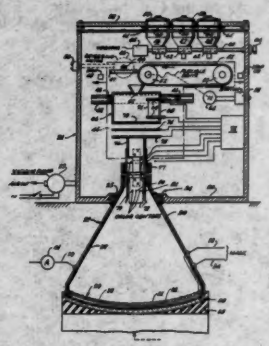
for ejection from the nozzle mechanism and insertion into the workpiece, and a trigger mechanism acts to resiliently reciprocate the nozzle mechanism with respect to the housing for selective pivotal movement of the jawlike members.

3,571,896
PIPE JOINT MAKE-OR-BREAK TOOL
James E. Wilkerson, Tyler, Tex., assignor to Tyler Pipe Industries, Inc., Tyler, Tex.
Filed Dec. 3, 1968, Ser. No. 780,630
Int. Cl. B23p *19/04*
U.S. Cl. 29—237 **4 Claims**



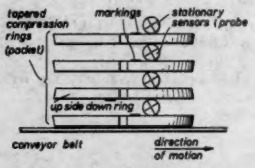
A make-or-break tool for making or breaking the joint between two sections of pipe in which the joint is of the character customarily termed a bell-and-spigot joint or simply a bell-type pipe joint, in which there are two spaced yokes that straddle the pipe and the yoke lever which is pivotally connected to one of the two spaced yokes and linked to the other so that operation of the lever on the axis perpendicular to the axes of the yokes to move the yokes longitudinally of their own axes relative to one another. The linking means is made adjustable so that the tool is applicable both to those situations requiring a long span between yokes at the initiation of operation and those requiring a very close relationship between yokes at such initiation. One of the links is made so that it may act as a yoke itself, being connected to the yoke lever on opposite sides of a pipe and extending across the pipe, which makes it possible to operate within an extremely short axial distance between yokes. Also, the yoke to which the yoke lever is linked is provided with a curved surface on one side to engage a curve on a fitting such as an elbow or a T and the flat surface on the other side to engage a flat surface on such fitting, and being reversible so that the surface desired may be presented in the direction desired. It is also provided with a means for mounting a pin that extends across the yoke to engage an abutment such as is molded onto the outer curve of an elbow of cast iron soil pipe. Finally the yoke that is connected to the lever by links is provided with a one-way pipe engaging and gripping means actuated by forces through the links to grip the pipe and prevent movement of such other yoke longitudinally of the pipe in the direction of the applied forces on the links. The yoke is also notched so that when reversed it will permit the links to extend past it without interference.

3,571,897
APPARATUS FOR MAKING A COLOR SCREEN FOR CATHODE-RAY TUBES
Hans W. Heil, Malibu, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.
Original application Aug. 25, 1966, Ser. No. 575,129, now Patent No. 3,479,711, dated Nov. 25, 1969. Divided and this application June 4, 1969, Ser. No. 858,214
Int. Cl. H01j *9/06*
U.S. Cl. 29—25.2 **10 Claims**



Apparatus for forming phosphor patterns on the faceplate of a cathode-ray tube, including means for electrically charging phosphor powder, means for forming the charged phosphor powder into a stream, and means for scanning the faceplate with the charged phosphor powder stream.

3,571,898
METHOD FOR MARKING AND DETERMINING THE ORIENTATION OF PISTON RINGS
Ernst Fuhrmann, Burscheid, Germany, assignor to Goetzewerke Friedrich Goetze A.G., Burscheid, Germany
Filed May 16, 1968, Ser. No. 729,788
Claims priority, application Germany, May 20, 1967, G50,202
Int. Cl. B23q *17/00*
U.S. Cl. 29—407 **7 Claims**

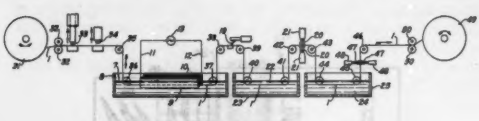


A method and apparatus for determining the orientation of a split piston ring; in particular, for determining whether the ring lies right side up or upside down. A mark made at least in part of an active substance is applied to the piston ring in the region of one of its gap ends and the ring is moved past a device for sensing the presence of the active substance.

3,571,899
MANUFACTURE OF METAL FOIL LEADS
John C. Sobleski, Russell, Ohio, assignor to General Electric Company
Filed Apr. 1, 1969, Ser. No. 811,884
Int. Cl. B23p *17/00*
U.S. Cl. 29—412 **11 Claims**

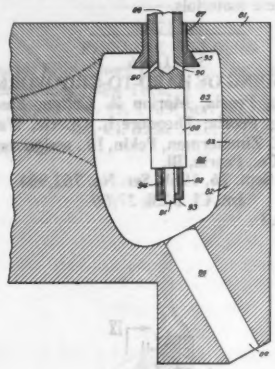
Metal foil leads for sealing into vitreous material are made by forming a metal foil ribbon into a series of successive foil

lead sections joined together by narrow connecting portions and having their edges feathered by etching, and then trans-



versely severing the ribbon at the connecting sections to separate it into individual metal foil leads.

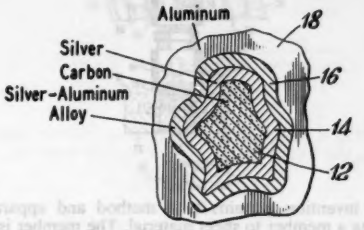
3,571,900
METHOD OF MOLDING A GOLF CLUB HEAD
Benjamin T. Hardesty, Columbia, S.C., assignor to Shakespeare Company, Kalamazoo, Mich.
Continuation-in-part of application Ser. No. 789,677, Jan. 8, 1969, Original application Sept. 15, 1967, Ser. No. 667,991. Divided and this application Dec. 8, 1969, Ser. No. 882,838
Int. Cl. A63b *53/04*; **B29f** *1/00*
U.S. Cl. 29—416 **6 Claims**



A plastic golf club head is formed in two major parts, a body member and a faceplate. Complementary dovetail members are provided on the body member and face plate so that the faceplate may be founded by sliding it onto the body member. To prevent movement therebetween when in position, an insert plug is inserted in channels provided in both the body member and faceplate in mutual registry. One or more plugs and complementary channels may be utilized. The plugs may be of any desired cross section. However, when only one plug is utilized, it should preferably have a noncircular cross section such as rectangular to prevent rotational movement of the faceplate. Where two or more plugs are utilized, they may be of any cross section. A screw is inserted either through the faceplate and engaged by a threaded insert in the body member, or alternatively inserted through the body member and engaged in a threaded means provided either in the insert plug or in the body member. The structure permits ready changing of the faceplate to provide the club head with various striking contours and angles. The insert plugs are preferably of the same cross section as the entry ducts of the mold used for molding of the plastic heads, so that the "trees" from molding of the heads may be used for insert plugs.

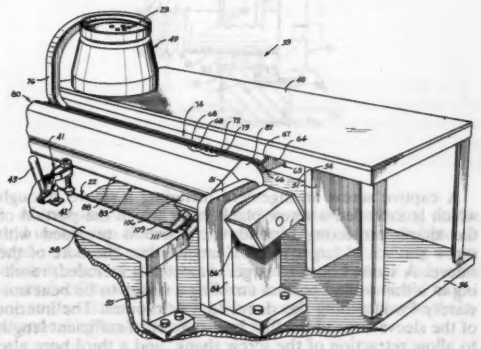
3,571,901
METHOD OF FABRICATING A CARBON-FIBER REINFORCED COMPOSITE ARTICLE
Raymond Vincent Sara, North Olmsted, Ohio, assignor to Union Carbide Corporation, New York, N.Y.
Original application May 9, 1968, Ser. No. 727,898. Divided and this application June 13, 1969, Ser. No. 833,009
Int. Cl. B23p *17/00*
U.S. Cl. 29—419 **5 Claims**

Light weight composite refractory articles comprising a plurality of metal or alloy coated carbon fibers bonded together by an aluminum base matrix are provided. The coating metal or alloy can be any material selected from the group consisting of silver, silver-aluminum base alloys and mixtures thereof. The preferred process for producing such composites comprises contacting silver coated carbon fibers with an aluminum base material followed by hot pressing the so-contacted fibers at the solidus temperature of the alu-



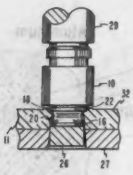
minum base material to infiltrate aluminum around the silver-coated fibers and then cooling the resultant article to a completely solidified state. Such composite articles are characterized by a high tensile strength coupled with a high modulus of elasticity and are especially suited as materials of construction for aerospace and hydrospace vehicles and systems.

3,571,902
METHODS OF AND APPARATUS FOR ASSEMBLING ELEMENTS WITH A SUPPORT
Richard A. Greene, Pickerington, Ohio, assignor to Western Electric Company, Incorporated, New York, N.Y.
Filed Feb. 10, 1969, Ser. No. 798,045
Int. Cl. B23p *19/00*; **H05k** *13/04*; **H01f** *7/06*
U.S. Cl. 29—429 **16 Claims**



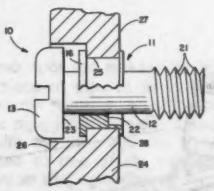
Methods of and apparatus for assembling a plurality of magnetic cores in a predetermined arrangement with associated nests of a support stick. A plurality of the magnetic cores are deposited successively into aligned nesting pockets of a loading slide in the predetermined arrangement. A plurality of pickup pins of a transfer mechanism pick up the magnetic cores in the predetermined arrangement and transfer the cores onto the associated nests of the support stick. Stripping sleeves then move over the pins and move the cores in the predetermined arrangement into the nests of the support stick.

3,571,903
METHOD OF SECURING A SELF-PIERCING AND CLINCHING ELEMENT TO A SHEET OF METAL
Eric H. Persson, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 13, 1968, Ser. No. 783,534
Int. Cl. B23p 11/00
U.S. Cl. 29—432.1 3 Claims



The invention pertains to a method and apparatus for securing a member to sheet material. The member is formed of material of equal or greater hardness than the sheet to which it is to be attached and in a single operation with a cooperating die is pressed against the sheet stock form its own aperture and deform the material of the sheet adjoining the member to positively secure member and sheet stock together. In an alternative embodiment the member is received in a prepared recess of a workpiece of hard material to effect attachment through a broaching action of the member with respect to the workpiece material.

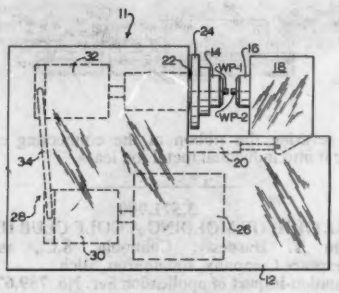
3,571,904
ARRANGEMENT FOR CAPTIVE SCREW
Bulent Gulistan, Malibu, Calif., assignor to Deutsch Fastener Corp., Los Angeles, Calif.
Continuation-in-part of application Ser. No. 590,601, Oct. 31, 1966, now abandoned. This application Nov. 8, 1968, Ser. No. 777,992
Int. Cl. B23p 11/00, 19/08; B21d 39/00; B21h 3/02
U.S. Cl. 29—443 7 Claims



A captive screw arrangement including a sleeve through which is extended a screw blank, after which the portion of the shank projecting beyond the sleeve is provided with screw threads of larger major diameter than the bore of the sleeve. A second bore of larger diameter is included, resulting in a thin-walled portion enabling a flange to be bent outwardly for attaching the sleeve to a workpiece. The interior of the sleeve beyond the first bore may be of sufficient length to allow retraction of the screw shank, and a third bore also may be provided to give the intermediate portion of the sleeve a thicker wall and greater strength than that at the thin-walled end.

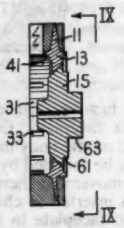
3,571,905
FRICTION WELDING SINTERED MATERIALS
Marion R. Calton, East Peoria, and Carl D. Weiss, Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed July 19, 1968, Ser. No. 747,779
Int. Cl. B23k 27/00
U.S. Cl. 29—470.3 4 Claims

Friction welding porous sintered materials, such as sintered steel, sintered copper and sintered alloys thereof to each



other and to other metals including process parameters for the welding of these materials.

3,571,906
FRICTION BONDING OF HARD-TO-GRIP WORKPIECES
Robert C. Barth, Peoria; Marion R. Calton, East Peoria; Daniel L. King, Peoria; Theodore L. Oberle, Washington, and Franklin E. Zimmerman, Pekin, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed Sept. 26, 1968, Ser. No. 762,904
Int. Cl. B23k 27/00
U.S. Cl. 29—470.3 6 Claims

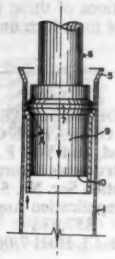


A process for friction or inertia bonding difficult-to-grip parts wherein the parts are mounted within fixtures and a low-melting-temperature alloy is poured into the fixtures so as to absorb hoop stresses and to prevent relative rotation between the workpiece and the fixture.

3,571,907
METHOD OF CLADDING A METAL SURFACE
Robert Douglas Watson, Deep River, Ontario, Canada, assignor to Atomic Energy of Canada Limited, Ottawa, Ontario, Canada
Filed Mar. 8, 1967, Ser. No. 621,609
Claims priority, application Canada, Mar. 21, 1966, 955,358
Int. Cl. B21d 39/04
U.S. Cl. 29—474.3 4 Claims

Aluminum cladding of zirconium alloy pressure tubes for nuclear reactors reduces the hydrogen pickup of the tubes. Cladding is achieved by heating in air both the aluminum and the alloy and stretch pressing, with sufficient pressure, the aluminum over the alloy. This technique appears to reduce

the oxide layer on the aluminum to a sufficient concentration to permit bonding between the metals over 85 percent of the



interface. Preferably the surface of the alloy is cleaned and polished immediately prior to heating.

3,571,908

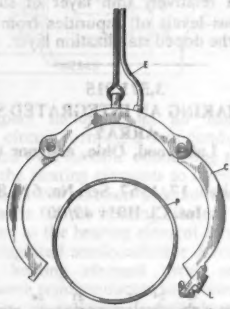
PIPELINE WELDING

Frank Joseph Pilia, Short Hills, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Filed Feb. 19, 1969, Ser. No. 800,408

Int. Cl. B23k *5/22, 31/02*

U.S. Cl. 29—493 **3 Claims**



A method for eliminating diameter mismatch between pipe sections to be welded by clamping the sections to be welded in a preheated clamp to cause expansion of the pipe sections to the inside diameter of the clamp. The clamp is designed to be stronger than the pipe sections to prevent overexpansion thereof.

3,571,909

METHOD OF JOINING STRUCTURAL MEMBERS OF A LADDER

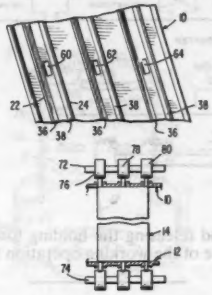
Melvin J. Stern, McComb, Miss., assignor to Croft Metal Products, Inc., McComb, Miss.

Filed Dec. 30, 1968, Ser. No. 787,759

Int. Cl. B21d *39/00;* **B23p** *11/00*

U.S. Cl. 29—509 **4 Claims**

Exceptional rigidity is imparted to a metal ladder by roll forging tabs at the ends of the steps and which project through the side rails. The roots of the tabs are expanded to fit tightly in the side rail openings and an enlarged head is formed on each tab which bears against the side rail and securely locks the step in place. The enlarged heads are con-



fined between ribs on the side rails, the ribs having mutually divergent opposed faces serving to wedge the parts together.

3,571,910

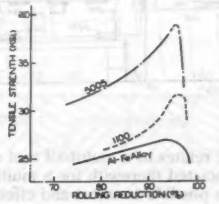
METHOD OF MAKING WROUGHT ALUMINOUS METAL ARTICLES

Linton D. Bylund, Chesterfield County, Va., assignor to Reynolds Metals Company, Richmond, Va.

Original application Aug. 11, 1967, Ser. No. 660,132, now Patent No. 3,397,044, which is a continuation-in-part of application Ser. No. 573,776, Aug. 8, 1966, now abandoned, which is a continuation-in-part of application Ser. No. 379,782, July 2, 1964, now abandoned. Divided and this application Jan. 16, 1968, Ser. No. 712,314

Int. Cl. B23k *19/00*

U.S. Cl. 29—527.7 **9 Claims**



Aluminum foil and other wrought articles including drawn and ironed can bodies are produced from aluminum base alloys containing up to about 2.5 percent iron, having a low work hardening rate above 75 percent reduction and sufficient ductility at high cold work levels to permit cold working to the extent of at least 90 percent without the necessity of annealing or stress relieving.

3,571,911

METHOD OF TREATING A WORKPIECE

Arthur K. Littwin, Lincolnwood, Ill., assignor to Arthur K. Littwin, Robert L. Littwin, Donald F. Littwin, & Horace A. Yound. Chicago, Ill., as trustees under trust dated 1/2/51 known as Littwin Family Trust No. 1

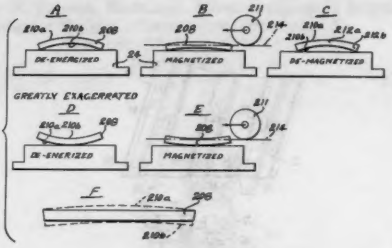
Original application May 1, 1963, Ser. No. 277,253, now Patent No. 3,368,119. Divided and this application Aug. 18, 1967, Ser. No. 661,642

Int. Cl. B23p *13/04*

U.S. Cl. 29—558 **4 Claims**

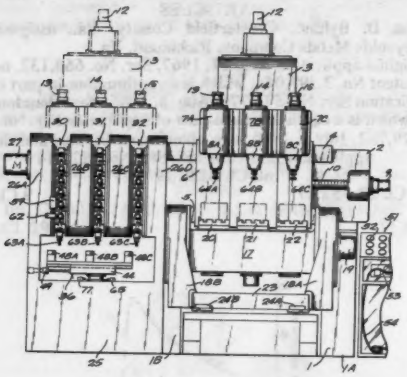
Magnetic chuck for holding a workpiece, the workpiece

often being distorted by the great magnetic force necessary



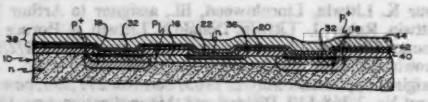
for holding it, and releasing the holding force in steps while reducing the force of the working operation thereon.

3,571,912
MULTITOOL TOOL CHANGER
Ervin J. Kielma, Milwaukee, Wis., assignor to Kearney & Trecker Corporation, West Allis, Wis.
Filed June 17, 1968, Ser. No. 737,415
Int. Cl. B23q 3/157
U.S. Cl. 29—568 **5 Claims**



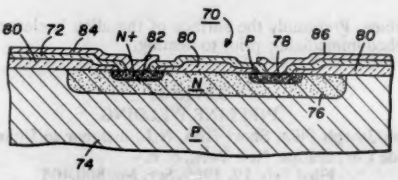
The disclosure relates to a multitool tool changer and to a tool storage associated therewith for a multispindle machine tool wherein it is possible to select and effect an interchange of tools for each spindle of the multispindle machine tool simultaneously.

3,571,913
METHOD OF MAKING OHMIC CONTACT TO A SHALLOW DIFFUSED TRANSISTOR
George E. Bodway, Mountain View, and Sanehiko Kakihana, Los Altos, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Filed Aug. 20, 1968, Ser. No. 754,049
Int. Cl. B01j 17/00; H01g 13/00; H01l 11/14
U.S. Cl. 29—571 **8 Claims**



An NPN microwave transistor is formed by diffusing a shallow P-type base region into an N-type collector region of a silicon-wafer and by diffusing an even more shallow N-type emitter region into the P-type base region. Platinum is alloyed to selected portions of the base region to form platinum silicide base subcontacts. Molybdenum and gold contacts are then formed on the platinum silicide base subcontacts and on the emitter region. These molybdenum and gold contacts are formed by successively depositing layers of molybdenum and gold on the wafer and by removing all but the desired contact portions of these layers with an etchant including ethylene glycol to reduce undercutting of the contacts during etching.

3,571,914
SEMICONDUCTOR DEVICE STABILIZATION USING DOPED OXIDATIVE OXIDE
Larry G. Lands, Garland, and Will F. Parmer, Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Continuation of application Ser. No. 518,234, Jan. 3, 1966, now abandoned. This application Aug. 27, 1969, Ser. No. 857,615
Int. Cl. H01l 7/00
U.S. Cl. 29—571 **4 Claims**



A stabilized semiconductor device and method of fabrication is disclosed in which a suitably doped silicon oxide stabilization layer for effecting surface passivation is disposed over a surface of a semiconductor device and separated from the surface by a relatively thin layer of silicon oxide to prevent deleterious levels of impurities from diffusing into the surface from the doped stabilization layer.

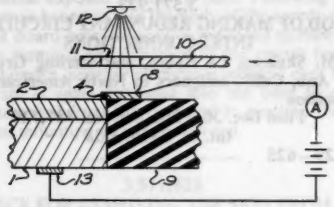
3,571,915
METHOD OF MAKING AN INTEGRATED SOLAR CELL ARRAY
Fred A. Shirland, Lakewood, Ohio, assignor to Clevite Corporation
Filed Feb. 17, 1967, Ser. No. 616,885
Int. Cl. H01v 49/00
U.S. Cl. 29—572 **6 Claims**

An integral battery of serially connected photovoltaic cells on a single insulating substrate. Metallized areas are formed on the substrate with semiconductive film such as cadmium sulfide vacuum evaporated upon each of the metallized areas. Barrier layers are formed on the cadmium sulfide films to produce PN junctions. Electrode leads extend from each metallized area under the semiconductor film to a top surface of the barrier layer of an adjacent semiconductor film.

3,571,916
SCHOTTKY EDGE CONTACT DIODE
Franz Joseph Landkammer, Woburn, Mass., assignor to Microwave Associates, Inc., Burlington, Mass. Division of
Ser. No. 648,018, June 22, 1967, Pat. No. 3,302,284.
Filed Mar. 14, 1969, Ser. No. 825,475
Int. Cl. B01j 17/00; H01l 7/02
U.S. Cl. 29—578 **4 Claims**

A semiconductor diode is disclosed made so that the Schottky barrier junction is applied to the edge of a semicon-

ductor wafer instead of some arbitrary point on its surface. The area, where contact is made to an electrode, is entirely



applied to an insulator adjacent to the edge junction. This structure provides large bonding area with small junction area.

3,571,917

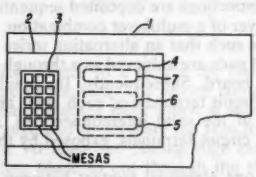
INTEGRATED HEATER ELEMENT ARRAY AND DRIVE MATRIX AND METHOD OF MAKING SAME

Jerry D. Merryman, and Edward M. Ruggiero, Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Original application Sept. 29, 1967, Ser. No. 671,821, now Patent No. 3,501,615. Divided and this application May 7, 1969, Ser. No. 847,751

Int. Cl. B01j *17/00;* **H01l** *15/00*

U.S. Cl. 29—573 **4 Claims**



Thermal display including an air isolated integrated semiconductor circuit forming a semiconductor heater element array joined by a metallic connecting pattern which extends out over the heating elements to interconnect selected ones of them and a PN junction isolated integrated semiconductor drive matrix for the heating element array positioned in the same plane as the heating element array. The PN junction isolated integrated semiconductor drive matrix and the semiconductor heating element array are concurrently formed in the same semiconductor substrate and the heating element array is air isolated to provide a high degree of electrical and thermal isolation for the heating element array while both are located in the same plane on a larger support. The thermally sensitive material on which a dynamic display is formed or on which a permanent display is printed is in direct contact with the monocrystalline semiconductor material of the heating circuit array and can be passed over the heating element array and the drive matrix.

3,571,918

INTEGRATED CIRCUITS AND FABRICATION THEREOF

Rolf R. Haberecht, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Original application June 23, 1966, Ser. No. 552,143. Divided and this application Mar. 28, 1969, Ser. No. 814,471

Int. Cl. B01j *17/00;* **H01l** *1/16*

U.S. Cl. 29—577 **7 Claims**

This specification discloses a method of forming an integrated circuit characterized by:

1. Forming on a given substance, respectively and without the usual complex, multihandling operations;

a. a first block of semiconductor material,

b. a second block of a reducible dielectric material;

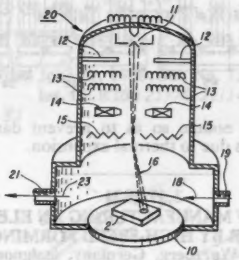
c. a third block of ferrite, and

d. an insulating film covering the substrate intermediate the first, second and third blocks;

2. Forming a semiconductor device in the first block;

3. Forming a resistor in the second block; and

4. Forming a capacitor or an inductor in the third block. An electron beam below a maximum power level is employed to effect the desired depositions and components with the substrate maintained in one reaction chamber. Various vaporous, or gaseous, reactants are flowed past the substrate during the respective operations but external contamination is avoided. Specific materials, reactants, and operations are given.



3,571,919

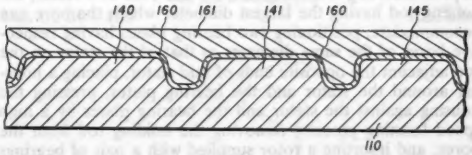
SEMICONDUCTOR DEVICE FABRICATION

Paul S. Gleim, Dallas; Kenneth E. Bean, and Stephen P. Emmons, Richardson, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of application Ser. No. 491,617, Sept. 30, 1965, now abandoned. This application Sept. 25, 1968, Ser. No. 764,038

Int. Cl. B01l *17/00;* **H01l** *1/16, 1/24*

U.S. Cl. 29—577 **4 Claims**



Disclosed is a method of forming a semiconductor device having circuit components in a semiconductor substrate which are electrically isolated from each other by a layer of etch resistant material. During the fabrication of the device the etch resistant material acts as an etch barrier that prevents the etchant from removing any portion of the semiconductor substrate used for the circuit components.

3,571,920

METHOD FOR TRANSISTOR MANUFACTURE

Quentin Berg, C/O Berg Electronics, Inc. York Expressway, New Cumberland, Pa.

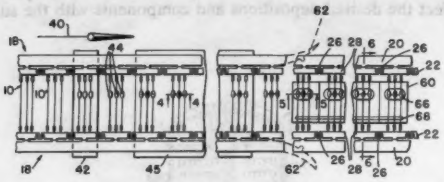
Original application Dec. 16, 1965, Ser. No. 524,986, now Patent No. 3,418,089, dated Dec. 24, 1968. Divided and this application May 27, 1968, Ser. No. 732,413

Int. Cl. B01j *17/00;* **H01l** *1/10*

U.S. Cl. 29—588 **3 Claims**

A method for the manufacture of transistors whereby groups of transistor lead wires are rigidly held during at-

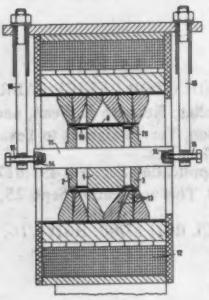
tachment of the transistor elements to the wires and are flexibly held during encapsulation of the transistor elements in a protective plastic nodule so as to prevent damage to the transistor elements due to thermal expansion.



3,571,921
METHOD OF MANUFACTURING AN ELECTRIC MOTOR BY HIGH-SPEED FORMING

Wolfgang Pieper, Wurzberg, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Germany

Filed June 30, 1969, Ser. No. 837,621
Claims priority, application Germany, July 3, 1968, P176363.4
Int. Cl. H02k *15/00*
U.S. Cl. 29—596 3 Claims

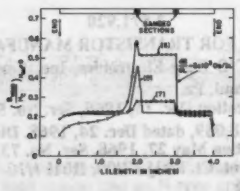


A method of manufacture of an electric motor includes the steps of inserting a holding rod into the bore of a stator, the holding rod having the largest diameter which the bore can accommodate, positioning two bearing plates having respective bores of the same diameter as that of the stator on the rod adjacent the opposite ends of said stator, placing a housing around the stator and the bearing plates, pressing the housing against the stator and the bearing plates by a high speed forming process, removing the holding rod from the bores, and inserting a rotor supplied with a pair of bearings into said bores.

3,571,922
METHOD OF FABRICATING A STRAINED SUPERCONDUCTOR MAGNET

Donald G. Schweitzer, Bayport, and Louis J. Nicolosi, Commack, N.Y., assignors to the United States of America as represented by the United States Atomic Energy Commission

Filed July 10, 1968, Ser. No. 743,701
Int. Cl. H01v *11/00*
U.S. Cl. 29—599 9 Claims

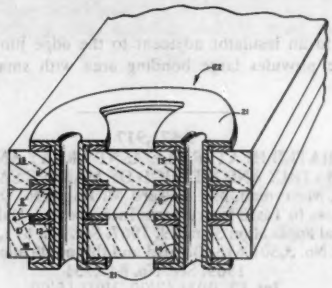


Method for straining a type I superconductor cylinder for retaining a desired magnetic field gradient in the bore thereof.

3,571,923
METHOD OF MAKING REDUNDANT CIRCUIT BOARD INTERCONNECTIONS

Joseph M. Shaheen, La Habra, and Sterling Graydon, Jr., Santa Ana, Calif., assignors to North American Rockwell Corporation

Filed Dec. 30, 1968, Ser. No. 787,720
Int. Cl. B41m *3/08*
U.S. Cl. 29—625 3 Claims



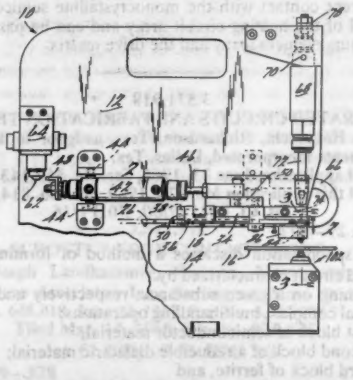
Solid interconnections are deposited sequentially on circuit pads of each layer of a multilayer combination. The interconnection is made such that an alternating series of solid metal posts and metal pads are achieved as a through connection of the multilayer board. Subsequently, the solid interconnections and the circuit terminals of each layer are drilled. The inner surfaces of the solid interconnections, and the inner surfaces of the circuit terminals, exposed by the drilling, are then plated.

As a result, one electrical contact between layers is provided through the undrilled portions of the solid interconnections contacting the circuit terminals of each layer. A second, or redundant, electrical contact is provided through the plated layer which contacts the surfaces exposed by the drilling.

3,571,924
TERMINAL APPLICATOR AND METHOD

Timothy F. Collins, York, Pa., assignor to Berg Electronics, Inc., New Cumberland, Pa.

Filed Oct. 11, 1968, Ser. No. 766,872
Int. Cl. H01r *9/16*
U.S. Cl. 29—625 12 Claims



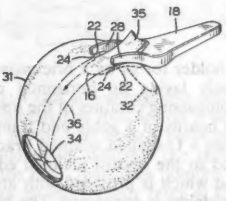
An applicator for mounting individual eyelet type terminals on a circuit board where the terminal is severed from

a carrier strip by a ram which moves the terminal through a transport bore until the terminal flange is clamped between the ram and lip at the end of the bore with the body portion of the terminal exposed out of the bore. Following positioning of a circuit board so that the body of the terminal is fitted in a circuit board hole, an anvil is extended to flare the free end of the terminal and secure it to the circuit board. The ram is withdrawn, another terminal is indexed over the bore, and the ram is again extended into the bore to eject the mounted terminal from the bore and to position the second terminal for mounting on a circuit board.

3,571,925
DEVICE FOR REMOVING THE SKIN FROM AN ORANGE OR THE LIKE

Herbert F. Deutschmann, 1230 Queens Blvd., Kitchener, Ontario, Canada

Filed Sept. 30, 1969, Ser. No. 763,752
Int. Cl. A47j 17/04
U.S. Cl. 30—24 **1 Claim**

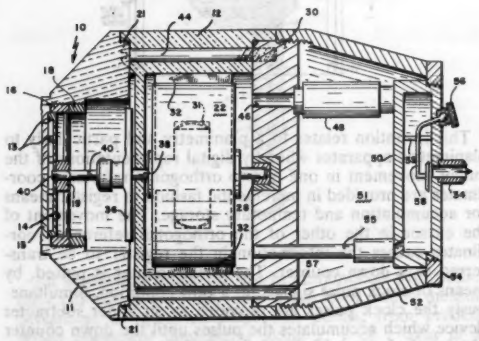


The invention relates to a device for removing the skin from an orange or the like. The device comprises a peeling blade which has a leading edge which is adapted to cut the skin of the orange and to separate the skin from the fruit by lifting the skin. At least one cutting edge extends upwardly from the peeling blade to cut through the thickness of the skin of the orange to cut the portion of the skin which has been separated from the fruit from the portion which remains attached to the fruit. A handle is connected to the blade for manual manipulation of the device.

3,571,926
VACUUM SHAVER

Glenn C. Ainsworth, 4526 Brookwood. NE, Albuquerque, N. Mex.

Filed Aug. 13, 1968, Ser. No. 752,228
Int. Cl. B26b 19/44
U.S. Cl. 30—41.5 **1 Claim**

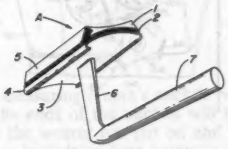


An instrument especially designed for providing space men with means for shaving. The apparatus provides for the control and collection of the cut whisker particles produced when shaving in a satellite environment. The shaver features a vacuum-driven motor which drives a rotary head. The cutting head has a vacuum cavity which draws the cut whisker particles and collects them in a cavity containing a filter.

3,571,927
NOVEL SAFETY RAZOR

Ray L. Stone, Hemlock Terrace, P. O. Box 567, Croton Falls, N.Y.

Filed June 21, 1968, Ser. No. 739,038
Int. Cl. B26b 21/08, 21/14
U.S. Cl. 30—51 **10 Claims**

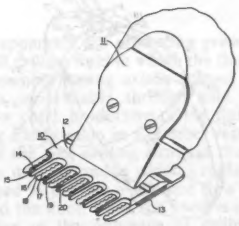


A light, plastic safety razor except for the metal blade therein comprising a plastic cover, a guard plate, a metal blade between said guard plate and said cover, a guard edge juxtaposed below the blade edge and joined to said guard plate, a nonstretchable flexible member attached to the bottom surface of the guard plate and extending therefrom along a first plane which is essentially perpendicular to the bottom surface, and a handle extending from said member in a direction lateral of said plane.

3,571,928
AUTOMATICALLY COMPENSATING HAIR BLENDING DEVICE

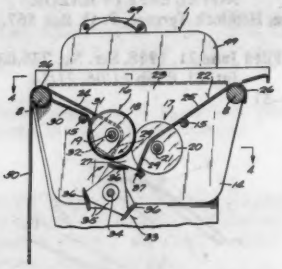
Glenn R. Willey, 1181 Bellemead Drive, Warminster, Pa.; William B. Fuller, Upperstate Road, Chalfont, Pa., and Vernon W. Biesecker, 1171 Bellemead drive, Warminster, Pa.

Filed Jan. 16, 1969, Ser. No. 791,655
Int. Cl. B26b 19/22
U.S. Cl. 30—195 **10 Claims**



Method and apparatus for blending hair which includes a plurality of cutting reliefs for capturing the hair to be blended wherein the reliefs are of arcuate configuration and disposed in the stationary cutting teeth. The configuration of the reliefs are such in respect to the stroke of the moving cutting teeth that a predetermined area of the relief is not traversed by the moving cutting teeth. A percentage of the hair in the relief will pass to the back of the relief and not be cut against shearing edges disposed within the relief. The area of the relief which is untraversed by the moving cutting teeth is constant resulting in the cutting of a percentage of thicker hair passing into the relief than thinner hair thus automatically compensating the blending effect according to the thickness of the hair being cut.

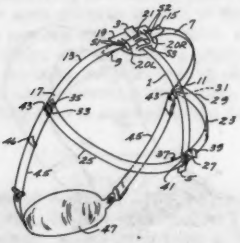
3,571,929
CURD MILL
Norman J. Peters, Fond du Lac, Wis., assignor to DEC-International Inc., Madison, Wis.
Filed July 1, 1968, Ser. No. 741,709
Int. Cl. A01j 25/06
U.S. Cl. 31—48 10 Claims



A curd mill for milling slabs of cheese curd. The curd mill includes a hopper to receive the curd to be milled, and two sets of intermeshing cutting discs are mounted for rotation within the hopper and serve to slice the curd. Located beneath the cutting discs is a reel having a series of generally herringbone-shaped blades which act to transversely cut the sliced curd into cubelike pieces.

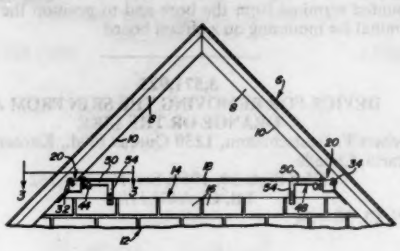
The curd mill is mounted on a support so that the upper, open end of the hopper is at an angle of about 10° to 20° to the horizontal and in addition, the curd mill is positioned at an angle of about 10° to 20° with the sidewall of the cheese making vat. With this angular disposition of the curd mill, the milled curd is discharged outwardly toward the center of the vat.

3,571,930
ADJUSTABLE HEAD GEAR
Irvin S. De Woskin, ST. Louis, Mo., assignor to Orthoband, Company, Inc., St. Louis, Mo.
Filed Aug. 15, 1969, Ser. No. 850,512
Int. Cl. A61c 7/00
U.S. Cl. 32—14 10 Claims



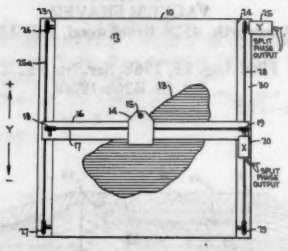
Adjustable headgear is disclosed which includes a first or occipital strap having an upper end and a lower end and is adapted to extend from the back of the head of the wearer upward to the top area of the head. A second strap having an upper end and a lower end is adapted to extend from the right side of the head of the wearer upward to the top area of the head. A third strap having an upper end and a lower end is adapted to extend from the left side of the head of the wearer upward to the top area of the head. A top adjustment piece has slits therein through which the upper ends of the straps pass so that the length of each strap from its lower end up to the adjustment piece can be adjusted by sliding the strap through the slits in the adjustment piece. Backstrap means has forward end portions connected to the lower ends of the second and third straps and extends around from the lower end of the second strap to the lower end of the third strap. The lower end of the first strap is connected to the strap means generally centrally of the latter.

3,571,931
BRICK LAYING DEVICE
Buddy Arnold Williams, Rte 2, Toccoa, Ga.
Filed July 22, 1969, Ser. No. 843,348
Int. Cl. B43l 7/00
U.S. Cl. 33—86 6 Claims



A guideline holder for us by a brickmason when planning and progressively laying up horizontal courses of bricks within the encompassing confines of the upwardly converging facia or freeze boards of a gable end frame structure. Each holder comprises a U-shaped adapted bracket which can be readily attached to the inward inclined edge portion of the facia board and which is provided with an upstanding hook to which the guideline is connected. The bight portion of the bracket is provided with a complemental L-type square whose depending short leg is provided with a properly calibrated level indicating and measuring scale.

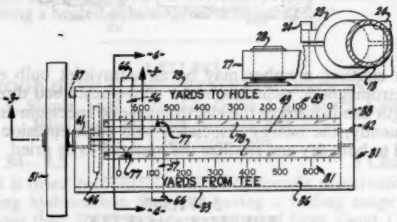
3,571,932
DIGITAL PLANIMETER
John G. Peddie, San Antonio, Tex., assignor to H. Dell Foster Co., San Antonio, Tex.
Filed Oct. 9, 1967, Ser. No. 673,577
Int. Cl. G01b 7/32; G06g 7/18
U.S. Cl. 33—123 11 Claims



This invention relates to a planimetry and particularly to planimetric apparatus whereby digital representations of the cursor movement in one of two orthogonal reference coordinates are provided in incremental fashion to register means for accumulation and temporary storage. The movement of the cursor in the other of the orthogonal reference coordinates causes the information in the register to be transferred to a down counter. The down counter is pulsed, by means of clock pulse signals, to a zero condition. Simultaneously the clock pulses are provided to an adder subtracter device which accumulates the pulses until the down counter obtains the zero output condition. Control means are provided such that the pulse information which is entered into the adder/subtracter unit provides the correct updated pulse accumulation which represents the total summation of the incremental information stored in the register and periodically

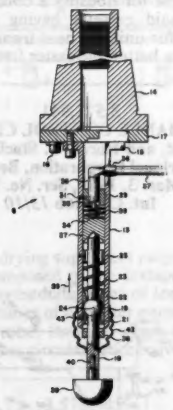
transferred to the down counter. The accumulated information in the adder/subtracter device may be displayed to provide a current indication of the area traversed by the cursor.

3,571,933
DISTANCE INDICATOR FOR GOLF CART
Thomas H. Johnson, Box 811, Auburn, Calif.
Filed Oct. 23, 1968, Ser. No. 769,809
Int. Cl. G01b 3/12; G01c 22/00
U.S. Cl. 33—142 **1 Claim**



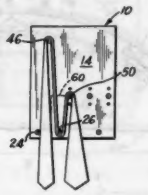
Mounted on a golf cart and engageable with a wheel of the cart is a meter calibrated to indicate on a yardage scale the distance traveled by the cart on any particular hole. An inverse scale simultaneously indicates the remaining distance from the cart to the hole. Indicating pointers traveling along the two scales can be individually reset at the beginning of each hole or at the conclusion of each stroke. A cumulative yardage indicator is also optionally utilized.

3,571,934
THREE-AXIS INSPECTION PROBE
Ernest J. Buck, Sr., Pasadena, Calif., assignor to Lockheed Aircraft Corporation, Burbank, Calif.
Filed June 24, 1968, Ser. No. 739,226
Int. Cl. G01b 7/28
U.S. Cl. 33—174 **15 Claims**



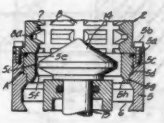
An inspection probe for use in conjunction with numerically controlled machine tools is disclosed which measures deviations, at specified inspection points, from predetermined numerical dimensions along *x*, *y* or *z* axes in accordance with a predetermined taped program. The probe incorporates mechanical means for inhibiting *x* and *y* axis deflections while making *z* axis measurements, and conversely. The output may be continuously recorded by means of a pneumatic or an electrical strip chart recorder.

3,571,935
NECKTIE MEASURING DEVICE
Louis W. Van Wye, Kansas City, Mo. (12604 E. 49th ST., Independence, MO 64055)
Filed Nov. 12, 1968, Ser. No. 774,916
Int. Cl. G01b 3/38
U.S. Cl. 33—180 **10 Claims**



A device for measuring a man's necktie before it is put on to insure that the ends of the necktie will be in the desired alignment once the wearer has put on and tied the tie. The measuring device includes a base having a plurality of posts including a neck-size post, a knot post, and a plurality of guideposts, the posts being positioned on the base in predetermined spaced relationship whereby the necktie may be trained thereabout and appropriately adjusted to indicate the position the ends of the necktie will assume after it has been placed about the neck of the wearer and tied.

3,571,936
HIGH OR LOW FLUID FLOW SIGNALLING APPARATUS
Raymond G. Taylor, Jr., Los Angeles, Calif., assignor to Byron Jackson, Inc., Long Beach, Calif.
Original application June 18, 1968, Ser. No. 737,960, now Patent No. 3,468,035, dated Sept. 23, 1969. Divided and this application July 17, 1969, Ser. No. 862,109
Int. Cl. G01c 9/00
U.S. Cl. 33—205 **5 Claims**



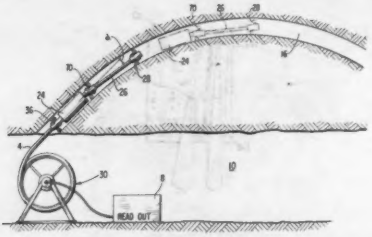
Signalling apparatus for producing pressure pulses in the stream of well drilling fluid in which the fluid flows through a pulse ring assembly having axially spaced rings cooperative with a knob reciprocable through said rings to provide restricted flow paths productive of the fluid pressure pulses in the drilling fluid stream in a number representative of the disposition of the well drilling string in the well bore in the vicinity of the drill bit, and in which a replaceable flow bushing is employed to provide a selected flow area between the pulse ring and the knob when the knob is in its normal position responsive to the influence of drilling fluid pressure thereon, so that movement of the knob to said position is assured under the prevailing flow rate. Such apparatus in which a gravity responsive pendulum system is utilized to determine the extent of movement of said knob and releasable latch means connect the gravity responsive means to the knob.

3,571,937
METHOD AND APPARATUS FOR DETERMINATION OF ORE SAMPLE LOCATION
Howard V. Sears, Box 123, Flat River, Mo.
Filed Nov. 24, 1967, Ser. No. 685,671
Int. Cl. E21b 47/02
U.S. Cl. 33—205 **6 Claims**

A sensing device which defines the terminal position and inclination of a curved prospect hole drilled from a passage in a mine by indicating the distance, slope and deflection,

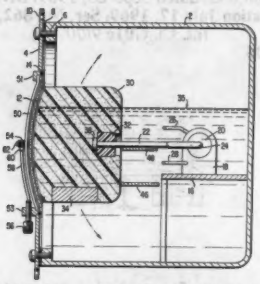
from initial position and azimuth, of progessive points along the hole.

An in-hole sensor is provided with a plurality of potentiometers mounted on mutually perpendicular axes to which are attached pendulums. Angular changes in inclination and attitude of the sensor with reference to the pendulum's vertical position cause related electrical outputs from the potentiometers which can be read as degrees by a readout instrument. Other potentiometers therein have their electrical outputs altered to an extent proportional to the deflection of the hole.



According to the method of the invention cross section samples may be taken from the ground surrounding and in the plane of mine workings by drilling curved prospect holes from within existing mine openings.

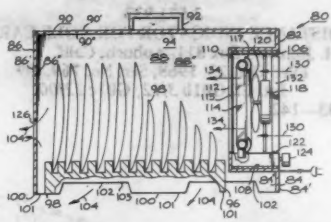
3,571,938
AIRCRAFT ATTITUDE INDICATOR
Bruce W. Branick, 3800 27th St., Port Arthur, Tex.
Filed Dec. 23, 1968, Ser. No. 786,169
Int. Cl. G01c *9/20*
U.S. Cl. 33—206 **10 Claims**



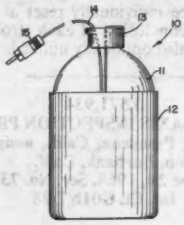
An aircraft attitude indicator having a float for oscillation about a horizontal axis and for rotation about an axis normal to said axis. Indicating markings carried by the float and casing provide for fast observation of the attitude of the craft. An adjustable horizontal marker is provided for compensating for the trim of the craft.

3,571,939
DISH DRYING AND STERILIZING ARRANGEMENT
Beverly Paul, 971 S. Elden, Apt. 28, Los Angeles, Calif. 90006
Filed Sept. 4, 1969, Ser. No. 855,234
Int. Cl. B01k *5/00*
U.S. Cl. 34—1 **9 Claims**

An improved drying and sterilizing arrangement is provided that is particularly adapted for drying dishes, silverware, pots and pans, et cetera. As disclosed, there is an open bottomed hood member having sidewalls, end walls and a top, and this hood member may be positionable over a dishrack in which the material to be dried and sterilized is contained. The hood member is provided with a source of electromagnetic radiation that emits electromagnetic radiation in the wave length bandwidths in the ultraviolet portion of the electromagnetic radiation spectrum as well as the visible and infrared portions. Means for moving air from regions external the hod through the walls defining the hood and over the material to be dried and thence exhausted to regions external the hood are also provided and which means may comprise a motor driven air fan. The electromagnetic radiation emitting member may be an ultraviolet bulb emitting electromagnetic radiation in the above-described three wave length bandwidths of the electromagnetic spectrum and, consequently, the energy associated with such emission is utilized to both dry and sterilize the material to be dried.

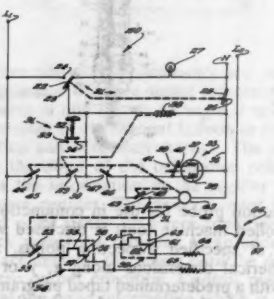


3,571,940
THERMAL CASSETTE
Charles E. Bender, New Paltz, N.Y., assignor to Cenco Medical/Health Supply Corporation, Chicago, Ill.
Filed Apr. 21, 1969, Ser. No. 817,904
Int. Cl. F26b *5/06*
U.S. Cl. 34—5 **2 Claims**



A thermal cassette for housing a container of material to be freeze dried, said cassette having radiation absorbing quality to provide for uniform heat transfer to the container contents to promote better and faster freeze drying.

3,571,941
APPLIANCE CONTROL CIRCUIT
Richard L. Garfield, and Harold S. Stacik, St. Joseph, Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.
Filed Mar. 3, 1969, Ser. No. 803,818
Int. Cl. F26b *13/10*
U.S. Cl. 34—45 **10 Claims**



An appliance control circuit for a dryer or a combination washer dryer employs a plurality of thermostat devices and a

timer to control the heat supplied to the appliance from a pair of heating elements to provide a modulated heat supply and a cool-down portion for the drying cycle.

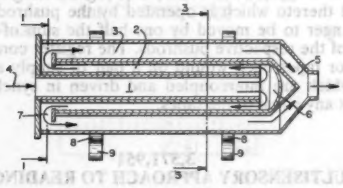
3,571,942
PROCESS FOR PRESERVING FLOWERS
Henry E. Orensten, and Vivian C. Orensten, 2648 Inglewood Ave. S., Minneapolis, Minn.
Filed Sept. 8, 1969, Ser. No. 856,216
Int. Cl. F26b *3/00, 5/00*
U.S. Cl. 34—9 9 Claims

This invention relates to a process for drying and naturally preserving flowers and flower color. The process includes controlled pressing the flower between porous sheets, while maintaining a heated dehumidified atmosphere.

3,571,943
WOOD DRYING AND PRESERVING PROCESS
Hulbert E. Sipple, 3481 El Dorado Drive, Long Beach, Calif.
Filed June 23, 1969, Ser. No. 836,223
Int. Cl. F26b *5/00, 5/04*
U.S. Cl. 34—9.5 8 Claims

Wood is dried by contact with an optionally preservative-containing hydrocarbon fraction, having a boiling range of not greater than 70° F. at a temperature of from about 125° F. to about 275° F. followed by exposure to subatmospheric pressure.

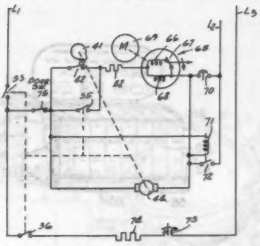
3,571,944
ROTARY HEAT EXCHANGING APPARATUS
Victor Duhem, Fontainebleau, Avon, France, assignor to Venot-Pic, Franklin-Roosevelt-Avon, France
Filed Feb. 3, 1969, Ser. No. 796,008
Claims priority, application France, Feb. 28, 1968, 141704
Int. Cl. F26b *17/10*
U.S. Cl. 34—57 1 Claim



An apparatus for drying sugar beet pulps, fodder plants and similar products, composed of the juxtaposition of a central tube, a series of intermediate tubes of lesser diameter and a series of peripheral tubes of diameter equal to or greater than that of the central tube, through which the products to be dried and the hot gases circulate successively.

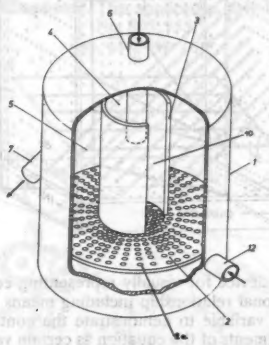
3,571,945
DRYER CONTROL CIRCUIT EMPLOYING TIMER HAVING TWO SPEEDS
Alvin J. Elders, Stevensville, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.
Filed June 25, 1969, Ser. No. 836,465
Int. Cl. F26b *19/00*
U.S. Cl. 34—53 3 Claims

A dryer control includes two camstacks, one operating continuously with the timer motor and the other driven by the timer motor under the control of a bimetal strip, connected in series with the dryer motor to provide intermittent operation thereof in accordance with the heat generated by the motor current traversing the bimetal strip, thereby to



provide two modes of operation in a dryer program having drying, cool down and antiwrinkle cycles.

3,571,946
REACTOR FOR REACTIVATING SOLID PARTICULATE MATERIAL WITH A GASEOUS MEDIUM
Joachim Karweil, Essen, and Josef Degel, Bochum, Germany, assignors to Bergwerksverband GmbH, Essen, Germany
Filed July 28, 1969, Ser. No. 845,238
Claims priority, application Germany, July 26, 1968, P 17 69 859.8
Int. Cl. F26b *17/10*
U.S. Cl. 34—57 19 Claims

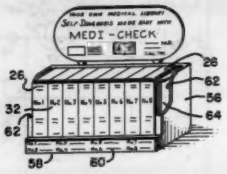


A reactor for reactivating solid particulate material with a fluid comprising a reaction chamber including a perforated bottom wall and upright wall means disposed on the bottom wall and defining within the reaction chamber a central whirl chamber and a first and a second annular whirl chamber surrounding the central whirl chamber. Passageways are provided in the wall means to interconnect the respective whirl chambers. A first inlet is provided to supply solid particulate material to the central whirl chamber and a second inlet communicates with the perforated bottom wall to supply a fluid therethrough to fluidize the particulate material in the central whirl chamber. The particulate material in fluidized condition is subsequently transferred to an outlet via the first and second annular whirl chambers.

3,571,947
MEANS FOR IDENTIFYING SKIN BLEMISHES
William D. Maddison, Denville, N.J., and James J. De Lade, 195 C. Main St., Little Falls, N.J.
Filed Oct. 1, 1968, Ser. No. 764,101
Int. Cl. G09b *23/28*
U.S. Cl. 35—17 4 Claims

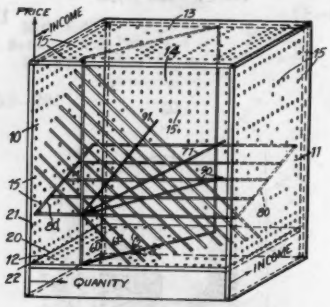
A flexible, compliant film of plastic on which is represented any one of a plurality of discrete skin blemishes.

A handbook associated therewith illustrates all said discrete blemishes, identifies each by name, signifies the pathogenesis thereof, and prescribes theraputic prescriptions therefor. Each film-blemish and handbook illustration thereof is cross-



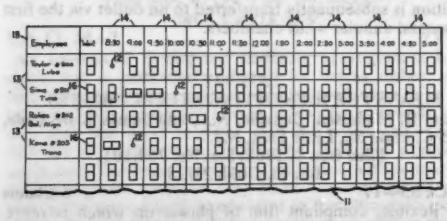
indexed to effect identification of said film-blemish, said film being provided for laying upon the body, adjacent to a naturally subsisting skin blemish, to identify the latter and to determine the treatment therefor via reference to said handbook.

3,571,948
ECONOMICS TEACHING DEVICE
John T. Heffernan, 30 Brigham Road, Worcester, Mass.
Filed June 12, 1969, Ser. No. 832,621
Int. Cl. G09b *19/18, 23/04*
U.S. Cl. 35—24 **7 Claims**



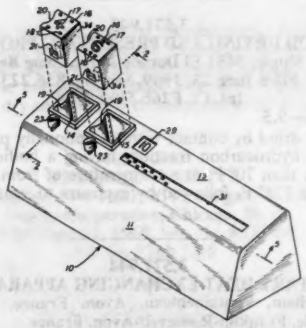
A teaching device for visually representing equations in a three-dimensional relationship including means to effect adjustment of a variable to demonstrate the continuous interplay of the elements of the equation as certain values change. The device is particularly useful for visually illustrating the relationships of basic units in economic theories under conditions of continuous variation of different aspects of the economic data.

3,571,949
WORKSHOP DISPATCH SYSTEM
John C. Gormley, 115 Mira Loma, Vallejo, Calif.
Filed June 17, 1969, Ser. No. 833,929
Int. Cl. G09b *19/18*
U.S. Cl. 35—24 **6 Claims**



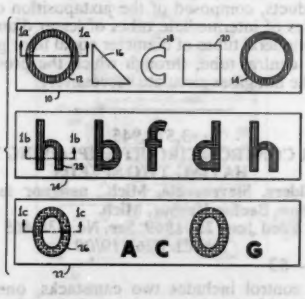
A work scheduling and job dispatch system for use in workshops such as auto repair shops including a first peg-board section for inventorying available man/time intervals per job specialty performed in the shop, a second pegboard section for inventorying received work to be performed in the shop, and a plurality of pegs each identifying an employee and a preselected time interval, adapted for transfer between the pegboard sections whereby available man/time intervals per job specialty are assigned to the available work.

3,571,950
TEACHING DEVICE
Richard K. Walker, 3 Bradley Road, Convent, N.J.
Filed Oct. 27, 1969, Ser. No. 869,548
Int. Cl. G09b *19/02*
U.S. Cl. 35—31 **6 Claims**



A device for teaching arithmetic has two sockets for receiving numbered blocks and has a register with one indicator for showing the number or sum of numbers of the block or blocks inserted in the device and a second indicator for showing an equal quantity of items. A coupling mechanism between the blocks and the register comprises pushrods operated by the blocks according to their respective numbers and an intermediate plunger having a rock lever pivoted thereto which is operated by the pushrods to cause the plunger to be moved by one-half the sum of the movements of the respective pushrods. The register comprises two indicator tapes each wound on a pair of supply and takeup reels which are intercoupled and driven in synchronism to prevent any stress of the tapes.

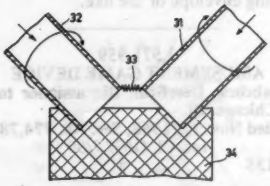
3,571,951
MULTISENSORY APPROACH TO READING AND READING READINESS
Herbert A. Siegel, and Dorothy G. Siegel, 901 Barebranch Court, Baltimore, Md.
Filed Oct. 24, 1968, Ser. No. 770,322
Int. Cl. G09b *17/00*
U.S. Cl. 35—35 **14 Claims**



Methods of multisensory association for reading and reading readiness comprising providing material having mul-

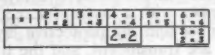
ticharacteristic indicia associated therewith, such as color, size and texture, scanning the material by sight, and simultaneously scanning the material by feel whereby a plurality of senses are utilized.

3,571,952
ELECTRODE HOLDER FOR USE WITH AN INTERMITTENTLY OPERATED SPARK GAP
Siegfried Schmidt, Hamburg, and Bernd Ehlers, Tornesch, Germany, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Oct. 9, 1967, Ser. No. 673,774
Claims priority, application Germany, Oct. 22, 1966, P40707
Int. Cl. H01j *7/44, 13/46*
U.S. Cl. 315—35 **6 Claims**



An electrode holder arrangement with two spaced electrodes defining a spark gap therebetween and provided with an insulator means within the spark gap for defining a spark waveline path. The electrodes are spring urged toward the insulator means and each other and are also mounted for rotation about the longitudinal axis.

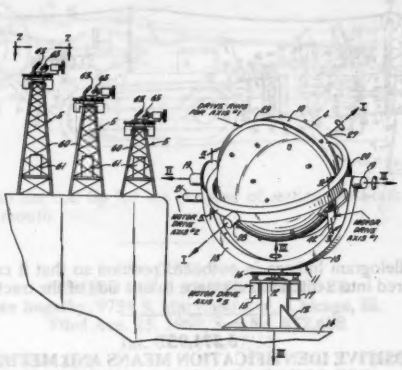
3,571,953
MULTIPLICATION GAME
Frank Sylvester Hassell, Jr., Marshall, Va., assignor to Acne Fund, Frank S. Hassel, Jr., sole administrator
Filed Jan. 3, 1969, Ser. No. 788,785
Int. Cl. G09b *19/02*
U.S. Cl. 35—31 **9 Claims**



This game is an aid in the learning of the multiplication tables, comprising a yardstick marked on one side with problems and the other with answers to tables 1 through 9 with corresponding numbers on tabs, approximately one-half being of different color.

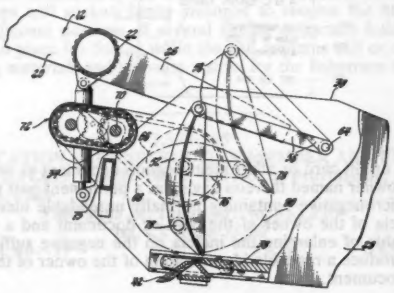
3,571,954
SPACE TRANSIT SIMULATOR PLANETARIUM
Wallace E. Frank, Westtown, Pa., assignor to Planetaria, Inc., Yorklyn, Del.
Filed May 13, 1966, Ser. No. 549,831
Int. Cl. G09b *27/00*
U.S. Cl. 35—42.5 **23 Claims**

A planetarium capable of simulating planet, sun and moon movements and changes as viewed from outside of, as well as within, cis-lunar space as provided by a star field projector preferably capable of projecting a selected portion of the celestial sphere in any desired orientation and projectors for sun, moon and planets separate from the star field projector and one another capable of projecting any possible orbit of the planets including those viewed from outside the ecliptic plane. Controlling and coordinating the drive means for the various projectors is a computer link which is preferably capable of being programmed for simulation of a selected view point in space for the planetarium audience, including a view point which is itself movable even as the planets are



movable and which preferably is based upon an operational principal of vectorial summation.

3,571,955
APRON LOADER FOR A SCRAPER
William H. Eiger, Eastlake, Ohio, assignor to General Motors Corporation, Detroit, Mich.
Continuation-in-part of application Ser. No. 644,128, June 7, 1967, now abandoned. This application July 15, 1969, Ser. No. 841,955
Int. Cl. B60p *1/00*
U.S. Cl. 37—4 **2 Claims**

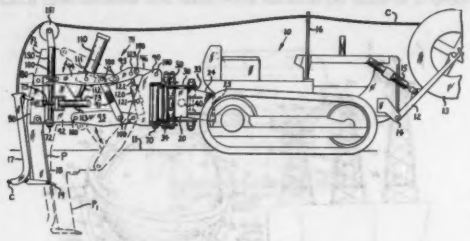


A scraper including a tractor and trailing bowl in which the latter is provided with an apron the upper end of which is connected with a pivoted control arm which guides the apron as the lower edge thereof is rotated by a drive crank so as to assist loading material into the bowl during a digging operation.

3,571,956
CABLE PLOW DRAFT LINKAGE
Robert C. Heiberg, 2115 N.E. 59th Ave, Portland, Oreg.
Filed Apr. 16, 1968, Ser. No. 721,801
Int. Cl. E02f *5/02;* **F16l** *1/00*
U.S. Cl. 37—98 **16 Claims**

A versatile plow for burying cable in a furrow behind a tractor or as much as 5 and ½ feet beyond either side of the tractor and in a roadside ditch below the level of the tractor or in a roadside embankment abode the level of the roadway on which the tractor travels. Such wide lateral adjustment is provided by a special hitch block and such great range of

vertical adjustment is provided by a special parallelogram linkage behind the hitch block. The hitch block places the



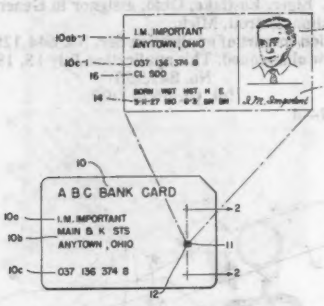
parallelogram linkage in outboard position so that it can be lowered into a ditch at a distance to one side of the tractor.

3,571,957

POSITIVE IDENTIFICATION MEANS AND METHOD FOR OWNER-PRESENTED DOCUMENTS

Peter N. Cumming, Dayton, and Earle F. Smith, Kettering, Ohio, assignors to The National Cash Register Company, Dayton, Ohio

Filed Jan. 4, 1968, Ser. No. 695,651
Int. Cl. G09f *3/02*
U.S. Cl. 40—2.2 **7 Claims**



A credit card or other identification document as issued to the owner named thereon having as a permanent part thereof a micronegative containing normally unreadable identifying indicia of the owner of the card or document and a viewer capable of enlarging the indicia on the negative sufficiently to produce a readable identification of the owner of the card or document.

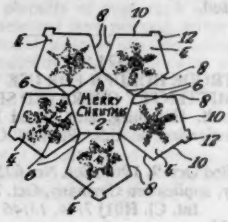
3,571,958

BLANKS AND CONSTRUCTIONS MADE THEREWITH

Trevor Stevens, 142 Chesterfield Avenue, Thundersley, Benfleet, Essex; Harry Martyn Secunda, 3,Beechwood Close, Mill Hill, London, N.W. 7, and Jonathan David Fiszpan, 22 Rundell Crescent, Hendon, London, N.W. 4, England

Filed Aug. 15, 1969, Ser. No. 850,429
Claims priority, application Great Britain, Jan. 3, 1969, 535/69
Int. Cl. G09f *1/00*
U.S. Cl. 40—124.1 **10 Claims**

A pop up display device is constructed from two blanks and a closed loop of resilient material. Each blank consists of a central polygonal panel to each edge of which is hingedly attached a pentagonal flap, which is further bounded by two inner sides flanking the side common to the flap and panel and two outer sides. At least one outer side of each flap may have a tab portion. The two blanks are placed with their panels in face to face contact and the closed loop is disposed about the periphery of the blanks so that it crosses each outer side and lies in contact with the exposed faces of the flaps. Under the influence of the closed loop of resilient material, the blanks are caused to adopt a polygonal configu-



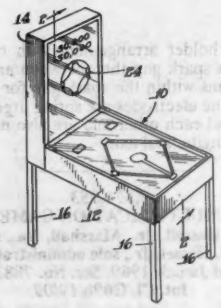
ration but can be flattened against the influence of the closed loop of resilient material for insertion into a flat container such as a mailing envelope or the like.

3,571,959

AMUSEMENT GAME DEVICE

Thomas C. Babcock, Deerfield, Ill., assignor to Pace Industries, Inc., Chicago, Ill.

Filed Nov. 12, 1968, Ser. No. 774,780
Int. Cl. G09f *7/00*
U.S. Cl. 40—135 **3 Claims**



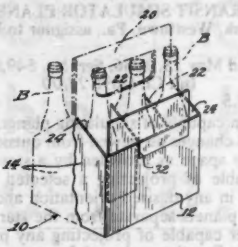
A panel for use in an amusement game device includes a supporting member and a protective layer mounted on the supporting member with a layer of screenprint between the supporting member and the protective layer. The panel has portions which are translucent, and the translucent portions provide a continuous smooth surface.

3,571,960

DISPLAY MEANS FOR USE WITH A CARRYING CARTON

Bernard Karel, 311 N. Desplaines St., Chicago, Ill.

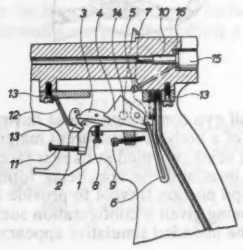
Filed Mar. 4, 1968, Ser. No. 710,232
Int. Cl. G09f *3/00*
U.S. Cl. 40—312 **1 Claim**



An inverted L-shaped card carrying advertising display material which is adapted to be positioned in a carrying car-

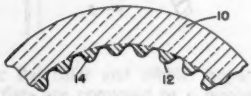
ton for bottles or the like, between the bottle and the sidewall of the carrying carton so that the display portion of the card is generally parallel to the sidewall of the carrying carton when same is shipped or transported, but wherein the display portion is positioned to extend outwardly and forwardly thereof when the carrying carton is displayed on the shelf in the store so that the display portion carrying the advertising material is readily seen and attracts the attention of the shopper when walking down the aisle of the store.

3,571,961
FIRING MECHANISM WITH A REARWARDLY ACTIVATED FIRING PIN
Joel Lehtinen, Karhula, Jumalniemi, Finland, assignor to Oy Sako AB, Riihimaki, Finland
Filed Oct. 7, 1968, Ser. No. 765,433
Int. Cl. F41c *3/00, 11/02, 19/00*
U.S. Cl. 42—69 **10 Claims**



A firing mechanism in small arms of the type, which use miniature rifle cartridges which present an annular detonating fuse located in the rim of the cartridge case, includes a trigger and a movement transmitting device which cause the firing pin to strike the rim of the cartridge to set off the detonating fuse. The striking pin is directed from the front, and moves backwards to the rim of the cartridge case.

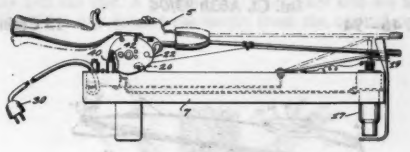
3,571,962
MONOLITHIC METALLIC LINER FOR FIBERGLASS GUN TUBES
Merrill Eig, Parsippany, N.J., assignor to the United States of America as represented by the Secretary of the Army
Filed June 10, 1969, Ser. No. 831,876
Int. Cl. F41c *21/02;* **F41d** *17/06, 17/08*
U.S. Cl. 42—76 **10 Claims**



A tubular device suitable for use as gun barrels and the like and being capable of withstanding sudden high pressures normally encountered in ordnance use, the device having a nonstructural metallic inner liner of noncircular configuration overwrapped by fiberglass windings acting in a structural capacity, and a resilient elastomeric material disposed between the liners at substantially uniform spaced intervals.

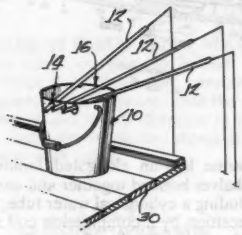
3,571,963
HOOK-SETTING ACCESSORY FOR FISHING POLE
Martin V. Ledbetter, 1714 Quillian, Pueblo County, Colo.
Filed Dec. 20, 1968, Ser. No. 785,678
Int. Cl. A01k *97/00, 97/12, 97/00, 97/12*
U.S. Cl. 43—16 **2 Claims**

The present invention comprises a frame for holding a fishing rod and having a quick acting solenoid whose vertically moving armature strikes the rod to impart a sharp upward thrust to the end of the rod in response to a first downward



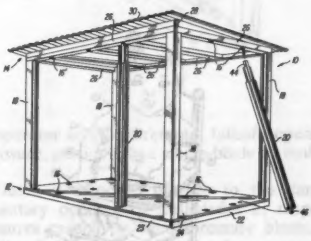
pull on the rod tip for the purpose of setting the hook in a fish's mouth.

3,571,964
FISHING POLE AND BAIT HOLDER
Stephen Bogathy, 9759 S. Maryland Ave., Chicago, Ill.
Filed Aug. 25, 1969, Ser. No. 852,688
Int. Cl. A01k *97/10*
U.S. Cl. 43—21.2 **9 Claims**



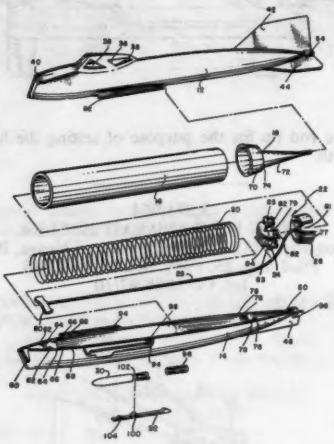
A pail having a cluster of cups along one side of its rim and a cluster of sockets in the side of the pail opposite the cups, the cups and sockets being arranged to receive the handle and adjacent portions of several fishing poles and hold the poles in place for fishing while the pail contains bait or other fishing materials and provides a stool for the fisherman to sit upon.

3,571,965
EDUCATIONAL CONSTRUCTION MEMBER AND UNIT
Bruce L. Gibb, Casilla 16074, Correo II, Providencia, Santiago, Chile
Filed June 11, 1969, Ser. No. 832,220
Int. Cl. A63h *33/06*
U.S. Cl. 46—19 **5 Claims**



A toy construction unit including beams provided with panel receiving channels and dowel receiving openings. When these beams are employed as uprights in a structure such as a toy house, some panels may be inserted into the channels to provide walls, and others may cooperate with supporting dowels to provide window or other openings. Still other panels may provide supports for level boards used to horizontally divide space within the house.

3,571,966
TOY BOAT
James E. Phelps, Apt 101, 420 E. 13th, Wichita, Kans.
Filed Jan. 7, 1969, Ser. No. 789,552
Int. Cl. A63h *23/04*
U.S. Cl. 46—94 **15 Claims**

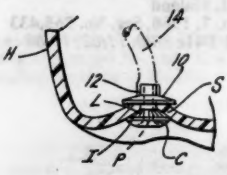


A toy submarine has an elongated hollow plastic body formed by two halves bonded together and contains a propulsion system including a cylindrical water tube, a piston biased toward a rear position by a compression coil spring disposed in the tube, and a cord extending forwardly in the tube from the piston and having a member external of the body for manual pulling the piston against the force of the piston spring thereby drawing in water behind the piston whereby upon release of the piston the body will be propelled by expulsion of water from the tube by the piston. The center of gravity is such that the body will nose over to dive when the piston is in forward position and will level off and will surface when the piston reaches rear position. The body also forms a pair of outrigger located torpedo tubes.

3,571,967
HIGH CHAIR DOLL
Marvin I. Glass, Chicago, and Leonid Kripak, Villa Park, Ill., assignors to Marvin Glass Associates, Chicago, Ill.
Filed May 7, 1969, Ser. No. 822,355
Int. Cl. A63h *13/00*
U.S. Cl. 46—116 **8 Claims**

A doll having a number of movable body members and internal driven means operatively coupled thereto, and a high chair having a motor and associated driving means for cooperating with the doll driven means to effect animation of the various body members. The doll is seated in the high chair and by insertion of a key in any of several pairs of aligned openings in the back of the high chair and the doll various movements of the doll are provided.

3,571,968
TEARING DOLL EYE
Harvey W. Samo, Maplewood, N.J., assignor to Margon Corporation, Rahway, N.J.
Filed May 14, 1969, Ser. No. 824,409
Int. Cl. A63h *11/00*
U.S. Cl. 46—135 **10 Claims**



A tearing doll eye comprising a lens having pupil and iris portions made of a body of transparent material, the iris portion of the lens being provided at its rear face with means for producing iris lines and the lens being formed with a duct through the pupil portion thereof to provide a tearing outlet, the said duct being given a configuration such as to produce and maintain the intended simulative appearance of the pupil and the iris.

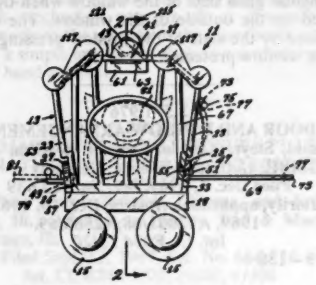
3,571,969
DOLL WITH MANUALLY MANIPULABLE UNIVERSALLY MOVABLE DOLL EYES
Harvey W. Samo, Maplewood, N.J., assignor to Margon Corporation, Rahway, N.J.
Filed May 19, 1969, Ser. No. 825,733
Int. Cl. A63h *3/40*
U.S. Cl. 46—168 **4 Claims**

A doll head with doll eyes mounted for universal movement in the eye sockets of the doll head, the eyes being provided with means manually manipulable by child for moving the eyes into a variety of different positions in the sockets for imparting amusingly different facial expressions to the doll.

3,571,970
MINIATURE WHEELED TOY VEHICLE
Ralph Dunn, Manhattan Beach; Armando P. Villasana, and Robert E. Finney, Los Angeles, Calif., assignors to Mattel, Inc., Hawthorne, Calif.
Filed Jan. 10, 1969, Ser. No. 790,209
Int. Cl. A63h *11/12*
U.S. Cl. 46—202 **3 Claims**

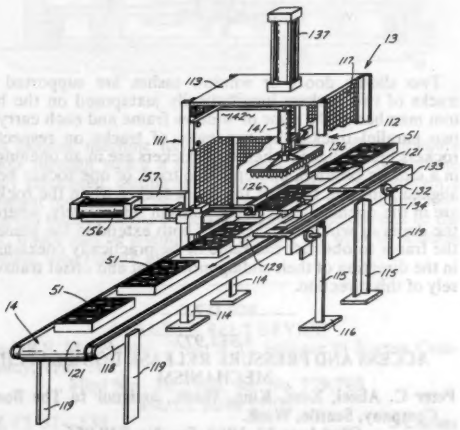
This is a miniature toy vehicle including an enclosure carried by rotatable wheels. The enclosure is adapted to be easily opened for access to a removable toy figure mounted therein and is fabricated in a single molding process. It generally comprises a lower frame portion to which opposite

sidewalls and end plates are hingedly connected and a roof section extending inwardly from the top of one of these



sidewalls. Also, a latching arrangement is included at the top of an opposite sidewall for releasably holding a portion of the roof section.

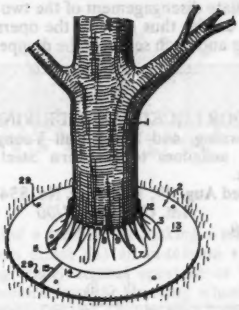
3,571,971
AUTOMATIC FLAT FILLER AND DIBBLER
Robert J. Broersma, Spring Lake, Mich., assignor to Hoyer Foundry and Machine Co., Kingston, Pa.
Filed May 23, 1968, Ser. No. 731,482
Int. Cl. A01g *9/08*
U.S. Cl. 47—1 **10 Claims**



An automatic flat filler and dibbler apparatus wherein empty nursery flats are conveyed to a hopper device and filled with packing media, such as soil. The filled flats pass under a compacting roller for compressing the material within the flats and are then moved under a scraper for removing excess soil from the flats. The filled flats are then transported to a dibbler mechanism with the flats being momentarily stopped to permit a dibbler plate to be pressed into the soil to form a plurality of dibbles or openings therein. The flat is then removed from the dibbler apparatus and is in condition for receiving transplants.

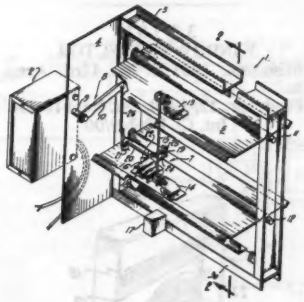
3,571,972
PROTECTIVE GROUND COLLAR
William J. Carter, Jr, 4700 LaVista Road, Tucker, Ga.
Filed Feb. 28, 1969, Ser. No. 803,146
Int. Cl. A01g *17/00*
U.S. Cl. 47—25 **7 Claims**

For enveloping upright elements such as trees, posts and the like at ground level to inhibit the growth of vegetation, a collar is formed of flexible water resistant sheet material and a main opening is formed therein from which a main slit extends to the outer edge of the sheet of material, the main slit being for the purpose of facilitating envelopment of a tree trunk and the like. A plurality of radial inner slits are formed in the sheet and extend outwardly from the central opening



to define a plurality of flexible fingers which are disposed against the tree trunk or post to inhibit plant growth. Preferably the sheet is of laminated construction and the inner slits are formed in such manner that the fingers formed in the two laminated sheets are disposed in staggered relationship and the main slits in the two sheets are disposed out of coincidence with each other.

3,571,973
CLOSURE OPERATOR
Frank D. Roberts, North Reading, Mass., assignor to Rixson Inc., Franklin Park, Ill.
Filed May 5, 1969, Ser. No. 821,791
Int. Cl. E05f *15/20*
U.S. Cl. 49—2 **12 Claims**



A closure operator to effect remote, failsafe opening and closing of a closure, particularly a single-blade or multiblade-type damper.

A damper latch is attached directly to the damper to prevent momentary opening of the blades in response to transient pressures caused by wind, pressure blasts, or the like. Appropriate linkages connect the closure operator to the damper latch and to all blades to effect opening and closing as desired.

In particular, the closure operator features a pivoted operator lever coupled to the damper linkages. An electromagnet carrier, including an armature latch, is driven by a motor to engage a cooperating driving arms latch pivoted on the operator lever. Engagement of the latter two latches locks the operator lever to the driven electromagnet carrier so that the lever and carrier move in unison.

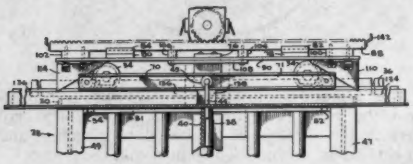
The carrier-controlled movement of the lever releases the damper latch and opens the damper blades. The lever and carrier are stopped in the damper open position, when a limit microswitch is actuated in response to full opening of the damper.

Upon the occurrence of (1) a manual switch operation to effect damper closure, (2) a power failure, (3) circuit malfunctioning, or (4) the detection of an undesired condition such as smoke or fire, the electromagnet is deenergized. This enables immediate disengagement of the two latches; and the electromagnet carrier thus releases the operator lever to immediately close and latch securely the damper blades.

3,571,974
CELL DOOR LOCKING AND DRIVING SYSTEM

James E. Browning, and David Hull Youngblood, San Antonio, Tex., assignors to Southern Steel Company, San Antonio, Tex.

Filed Aug. 29, 1969, Ser. No. 854,047
Int. Cl. E05b *53/00*
U.S. Cl. 49—18 **11 Claims**

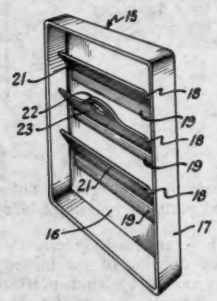


A housing enclosed cell door supporting carriage driven by an electric motor driven drive pinion engaging a rack on a reciprocable slide bar on the carriage with camming means on each end of the slide bar. The slide bar being movable through an overtravel increment at each end of travel of the carriage to bias a pivotable cell door lock bar operator carried by the carriage in a direction to move the lock bar into locking engagement with the door upon arrival of the door at either a fully open or fully closed position with the camming means also serving to move the lock bar to an unlocked position upon subsequent reapplication of driving force to the rack so that the door can again be moved.

3,571,975
WINDOW PROTECTOR

Stanley E. Misiaszek, 1951 S. W. 43rd. Ave., Fort Lauderdale, Fla.

Filed Apr. 22, 1969, Ser. No. 818,296
Int. Cl. E06b *9/00*
U.S. Cl. 49—51 **7 Claims**

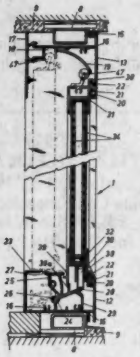


This invention is a window protector, made of fiberglass or any other desired material, and is especially adapted to be mounted on the outside and over a jalousie type of window. The protector embodies a panel the same shape and slightly larger than that of the window. The panel has a flanged periphery, thereby forming a shallow box in which is located a plurality of equally spaced and vertically disposed rectangular members or slats that have their lower edges suitably secured to the inside of the aforesaid panel. Each member has its upper edge set at a predetermined distance away from the panel, thereby permitting the edge to hook under one of the rectangular glass slats of the window when this invention is mounted on the outside of the window. The invention is held in place by the slats of the window pressing against the slats of the window protector.

3,571,976
DOOR AND WINDOW ARRANGEMENT

Kurt Schmid, Steyr, Austria, assignor to Alcan Aluminiumwerke GMBH, Gottingen-Wiende, Germany

Filed Dec. 5, 1969, Ser. No. 882,639
Claims priority, application Austria, Dec. 10, 1968, Mar. 17, 1969, A12001/68;A2568/69
Int. Cl. E05d *15/20*
U.S. Cl. 49—130 **13 Claims**

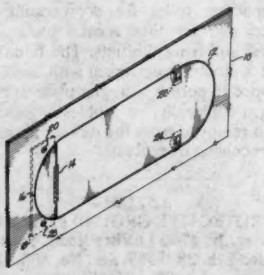


Two sliding doors or window sashes are supported on tracks of two rockers longitudinally juxtaposed on the bottom member of the door or window frame and each carrying two parallel tracks, the two pairs of tracks on respective rockers being aligned when both rockers are in an opening or in a closing position, and only one track of one rocker being aligned with one track of the other rocker when the rockers are in the opening and closing position respectively, whereby the doors or window sashes may both extend in the plane of the frame to obstruct the same or be practically coextensive in the direction of their sliding movement and offset transversely of this direction.

3,571,977
ACCESS AND PRESSURE RELEASE DOOR LATCH MECHANISM

Peter C. Abeel, Kent, King, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed June 27, 1969, Ser. No. 838,056
Int. Cl. E05b *65/06, 65/10*
U.S. Cl. 49—379 **6 Claims**



A force actuated latch mechanism for use in combination with an access and pressure relief door for a pressurized

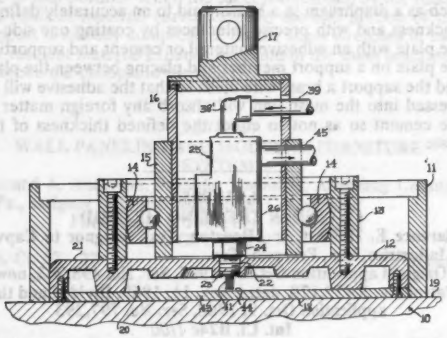
chamber. The preferred embodiment relates to a combined pressure relief and access door for an aircraft nacelle structure wherein the door is pivotally mounted near its forward or upstream edge and is provided with a spring-biased over-center latch mechanism near its aft or downstream edge. Quick release from the outside of the chamber is achieved by insertion of a simple implement such as a screwdriver and application of hand pressure.

3,571,978

LAPPING MACHINE HAVING PRESSURE PLATES, THE TEMPERATURE OF WHICH IS CONTROLLED BY A COOLANT

Lawrence Day; Joseph Dobrick, Chicago, and Arthur Kay, Evanston, Ill., assignors to Spitfire Tool & Machine Co., Inc., Chicago, Ill.

Filed Sept. 11, 1967, Ser. No. 666,716
Int. Cl. B24b *5/00, 29/00, 41/06*
U.S. Cl. 51—129 **5 Claims**



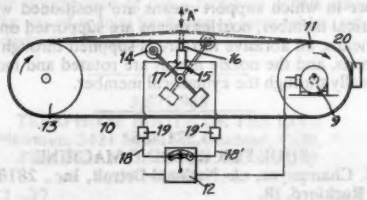
A lapping machine having one or more hollow pressure plates through which a coolant, such as water, is continuously circulated, during the lapping of work, to maintain a constant temperature of the lapping surfaces of the machine to avoid heating of the work or the means, such as wax or the like, which may be employed for holding the work in position beneath the pressure plate.

3,571,979

ABRASIVE BELT DEVICE

Randall S. Manchester, Troy, N.Y., assignor to Norton Company, Troy, N.Y.

Filed Nov. 29, 1968, Ser. No. 779,703
Int. Cl. B24b *21/00*
U.S. Cl. 51—135 **5 Claims**



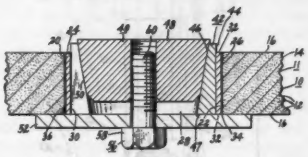
A method and means for incorporation into abrasive belt grinding equipment to extend the life of abrasive belts by regulating the belt breakdown rate for optimum operating life and by aiding in the removal of grinding swarf or other dulling and filling components from the abrasive surface while the abrasive belt performs its production operation.

3,571,980

ABRASIVE STRUCTURES HAVING A COMPRESSION-PRODUCING REINFORCING RING

Robert C. Fisher, Milford, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed June 3, 1969, Ser. No. 829,950
Int. Cl. B24b *5/00*
U.S. Cl. 51—206 **13 Claims**



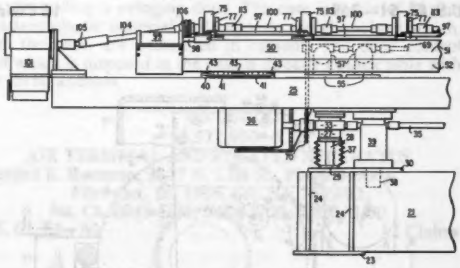
As an article and a method for making a reinforced grinding wheel wherein either (a) an in-tension ring is inserted into the grinding wheel central aperture or (b) an untensioned ring is inserted into the grinding wheel central aperture, and tensioned or (c) an annular disc formed of abrasive grains and a binder is molded around the periphery of an in-tension ring, with maintenance of the ring in its in-tension state until at least full attachment thereof to the peripheral surface of the grinding wheel central aperture. Reducing the tension induces a compressive stress on the peripheral surface of the grinding wheel central aperture which offsets a certain amount of the tensile stresses of rotation, thus allowing operation at higher speed and in greater safety.

3,571,981

BAR FEEDING APPARATUS FOR CENTERLESS GRINDING MACHINES

Robert L. Schaller, Camillus, and James M. Magistro, Clay, N.Y., assignors to Sundstrand-Engelberg Inc., Syracuse, N.Y.

Filed Apr. 17, 1969, Ser. No. 817,094
Int. Cl. B24b *47/02*
U.S. Cl. 51—215 **7 Claims**

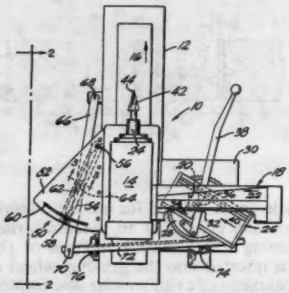


The bar supporting rolls are journalled in yoke members mounted on carrier beams extending on opposite sides of a main supporting beam. The rolls carried by each carrier beam engage the under peripheral surface of the bars at points spaced 45° circumferentially from the vertical plane passing through the axis of the bar. Screwjacks are provided to move the main beam vertically. Additional screwjacks are provided for moving the carrier beams transversely of the main beam. The movements of the main beam and the carrier beams are linear. A motor serves as a common power source to operate all of the screwjacks in unison, imparting transverse movement of each carrier beam equal to the vertical movement of the main beam, whereby the 90° contact spacing of the rolls with the bars is maintained for bars of all diameters. Means is provided for adjusting each yoke member relative to the carrier beam toward and from the axis of the bars to compensate for war on the rolls.

3,571,982
WORK MOVING APPARATUS

Joseph J. Ramge, 1495 Fairholme Road, Grosse Pointe Woods, Mich.

Filed June 16, 1969, Ser. No. 833,348
Int. Cl. B24b *3/06*
U.S. Cl. 51—219 5 Claims

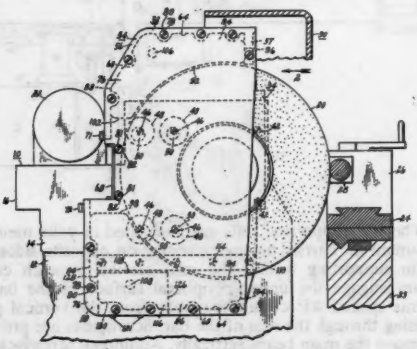


Apparatus for supporting a tool which must be accurately moved along a predetermined path relative to a cutter, grinding wheel, polishing wheel or the like for forming, grinding, polishing, and/or refluting of the tool wherein improved mechanism is provided for enabling variable proportioning of tool rotation and translation. A simple rack and pinion mechanism is incorporated in the work moving apparatus so that a desired change can be made in the amount of rotation of the tool achieved for each unit of translatory movement of the tool.

3,571,983
GUARD SYSTEM

Irving J. Stewart, Cincinnati, and Lloyd W. Helson, Milford, Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed May 6, 1969, Ser. No. 822,120
Int. Cl. B24b *55/04*
U.S. Cl. 51—269 12 Claims

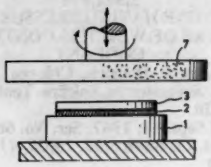


Rigid closed cell energy dissipaters for use in high-speed cutting tools interposed between the cutting tool and the inner surface of the cutting tool guard and/or the machine base and the cutting tool guard, for substantially dissipating the energy of impact of broken tool fragments. In addition, the cutting tool guard is capable of limited rotational movement and may be shear-mounted.

3,571,984
METHOD OF GRINDING THIN PLATES

Jacob Koorneef, and Jules Bos, Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 13, 1968, Ser. No. 783,619
Int. Cl. B24b *1/00*
U.S. Cl. 51—281 5 Claims

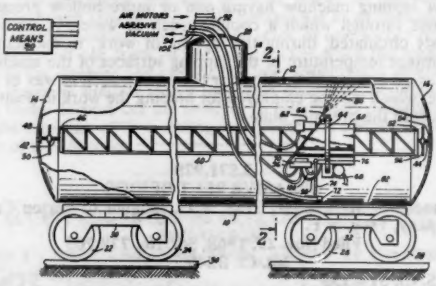


A method of grinding thin plates of brittle material for use such as a diaphragm in a hearing aid to an accurately defined thickness and with precise tolerances by coating one side of the plate with an adhesive material or cement and supporting the plate on a support member and placing between the plate and the support a brass wire mesh so that the adhesive will be pressed into the mesh and will absorb any foreign matter in the cement so as not to effect the defined thickness of the plate.

3,571,985
CYLINDER TREATING METHOD

Clarence E. Hulbert, Jr., Houston, Tex., assignor to Capvac Industries, Inc., Freeport, Tex.

Original application Oct. 20, 1965, Ser. No. 498,962, now Patent No. 3,477,178, dated Nov. 11, 1969. Divided and this application Oct. 9, 1968, Ser. No. 797,293
Int. Cl. B24c *1/00*
U.S. Cl. 51—319 1 Claim



A method of cleaning the interior of a hollow cylindrical member in which support means are positioned within the cylindrical member, nozzles means are supported on the support means, an abrasive mixture is supplied through the nozzle means, and the nozzle means are rotated and moved longitudinally through the cylindrical member.

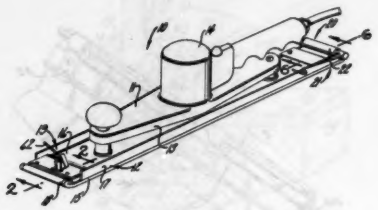
3,571,986
SHOE FOR RUBBING MACHINE

Roy J. Champayne, c/o National-Detroit, Inc., 2810 Auburn St., Rockford, Ill.

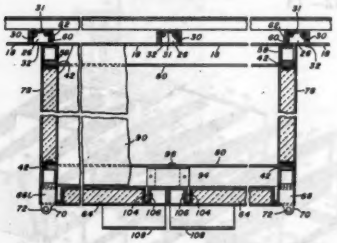
Filed May 29, 1969, Ser. No. 829,008
Int. Cl. B24b *21/04*
U.S. Cl. 51—368 9 Claims

An elongated rubbing shoe mounted for gyratory motion on a rubbing machine. To form the shoe, an elongated support is covered on its bottom and the top of one end portion with a layer of resiliently compressible material. A rubbing sheet underlies the layer, and one end of the sheet is anchored to the support by a clamp mounted on the top of

one end portion of the support. A roller mounted on the top of the other end portion of the support is operable to pull the sheet tightly around the resilient layer and hold the sheet tensioned between the clamp and the roller. One end portion of the support is bent upwardly, and the layer of resilient material is curved upwardly around that end portion and along the top of that portion. When the sheet is tensioned by the roller, the resilient material curving around the end portion of the support is radially compressed. As the sheet stretches in use, the resilient material expands to maintain the sheet tensioned between the clamp and the roller.



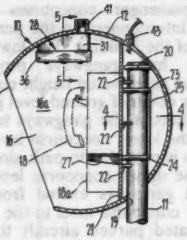
3,571,987
WALL PANELING AND MODULAR FURNITURE SYSTEM
Howard A. Anderson, Franklin Township, Allegheny County, Pa., assignor to United States Steel Corporation
Filed Apr. 16, 1969, Ser. No. 816,681
Int. Cl. F04f *19/04*
U.S. Cl. 52—27 **6 Claims**



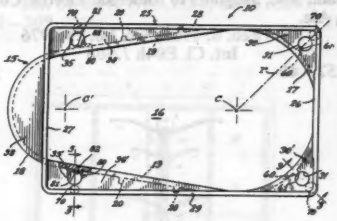
A system of wall paneling and room furniture including a plurality of panels of uniform width and thickness installed vertically upon an existing wall structure, hardware adapted to be received within a system of concealed holes in the paneling for supporting the furniture, and a modular furniture system constructed of basic furniture panels assembled through the use of special hardware to form tables, cabinets, shelving, desks and the like.

3,571,988
TELEPHONE BOOTH OR THE LIKE
Rollie B. Nawman, 3421 Hollis St., Oakland, Calif.
Filed Mar. 14, 1969, Ser. No. 807,275
Int. Cl. E04h *1/14*
U.S. Cl. 52—27 **16 Claims**

A booth or enclosure for housing a public telephone. The booth includes an upwardly extending support post secured to a floor or platform, and a hollow casing carried by the post and defining a chamber within which the telephone is supported upon a mounting plate secured to the post by fastener structure. The casing is curvilinear in substantially all directions and hangs from the post adjacent the upper end thereof. Access is afforded to the chamber and telephone therewithin through a large opening along one side of the casing, and all of the mounting structure by means of which the casing is secured to the support post is located within the casing and is concealed behind the mounting plate which is in substantially contiguous relation along each of its peripheral edges with the facing surfaces of the casing.

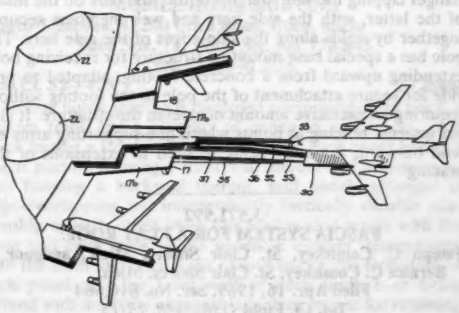


3,571,989
PLASTIC CEMENT CASE
Joseph J. Gaysowski, Westchester, Ill., assignor to Rixson Inc., Franklin Park, Ill.
Filed Feb. 24, 1967, Ser. No. 618,447
Int. Cl. E05f *7/00*; E04b *1/41*
U.S. Cl. 52—27 **13 Claims**



An improved cement case for effecting the floor mounting of a door control unit, such as a door closer or door check, for controlling a swinging door. The case is made of impact resistant plastic material and supports metal anchors which, with the case, are embedded in cement. The door control unit which is disposed in the case is directly connectable with the metal anchors.

3,571,990
AIR TERMINAL AND RELATED APPARATUS
Wendell E. Rossman, 3137 N. 53th St., Phoenix, Ariz.
Filed Oct. 18, 1968, Ser. No. 768,802
Int. Cl. E04h *6/06*; B66b *9/06*; B60s *13/00*
U.S. Cl. 52—30 **12 Claims**



Apparatus and structures for facilitating the loading and unloading of parked aircraft at an airport are disclosed. The

structures include a radial shaped air terminal building having upper and lower above ground concourse levels, and an intermediate main passenger receiving and check-in level and a plurality of subterranean levels. Each of the concourse levels includes passenger concourses with appropriate passageway gates interconnecting the passenger concourses with the exterior of the building. The lower level of the two concourse levels has gangways projecting from its passageway gates at an elevated height corresponding to the height of passenger doors of ground level parked aircraft that may be parked adjacent the gangways to facilitate loading the aircraft from the lower concourse level and unloading it thereto. Apparatus is provided to park aircraft at an elevated height adjacent the upper concourse level of the two concourse levels and gangways extend from the passageway gates of the upper concourse level to the passenger doors of the adjacent elevated parked aircraft to facilitate loading from the upper concourse level and unloading of the aircraft thereto. The apparatus includes a lift sled which can lift a parked aircraft to an elevated position adjacent the terminal building' s upper concourse level in two stages, insuring that the aircraft will not interfere with ground level parked aircraft adjacent the terminal building. The air terminal building's subterranean levels may be used for parking areas and mass transportation depots and are connected to the concourse levels and the main passenger receiving and check-in level by appropriate elevating means.

3,571,991
METAL POLE

Edward S. Doocy, Jackson, Mich., and Gerald E. Hertig, Birmingham, Ala., assignors to Anderson Electric Corporation, Leeds, Ala.

Filed Feb. 6, 1969, Ser. No. 796,976
Int. Cl. E04h *12/08*
U.S. Cl. 52—40 **38 Claims**

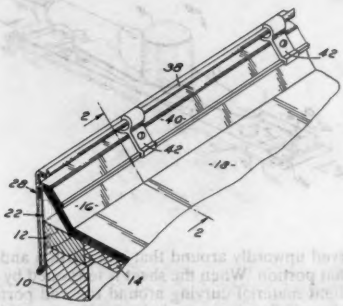
A tubular steel power transmission line pole having a high bending strength/cost ratio and aesthetic appearance, comprising a pair of side bars and web members having side flanges lapping the side margins of the side bars on the inside of the latter, with the side bars and web members secured together by welds along the side edges of the side bars. The pole has a special base mounting structure for receiving bolts extending upward from a concrete footing, adapted to provide for secure attachment of the pole to the footing without requiring an excessive amount of steel in the structure. It also has internal bracing at points where line-supporting arms extend outward, the arms being secured to extensions of this bracing.

3,571,992
FASCIA SYSTEM FOR A FLAT ROOF

Joseph C. Comiskey, St. Clair Shores, Mich., assignor to Bernice C. Comiskey, St. Clair Shores, Mich.

Filed Apr. 16, 1969, Ser. No. 816,664
Int. Cl. E04d *1/36, 3/38, 13/15*
U.S. Cl. 52—60 **11 Claims**

A marginal edge construction for a generally flat roof deck including an upright fascia strip extending longitudinally along the edge of the roof in overlying relation with the waterdam or cant, a liner flashing strip fitting against the fascia strip and overlying the marginal edge portion of the layers of roofing material, and a plurality of anchor members disposed in spaced-apart relation along the length of the

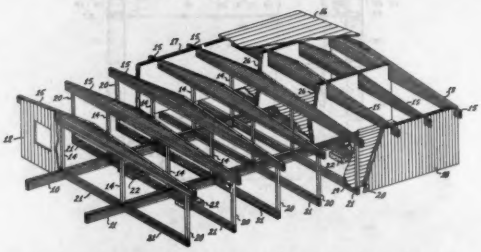


fascia strip and liner strip lockingly engaged with the upper end of the fascia strip, with the securing means in the form of screws or the like for securing the anchor members to the roof deck and maintaining the entire fascia system assembly in proper position.

3,571,993
TRANSPORTABLE PREFABRICATED BUILDING STRUCTURE WITH CANTILEVERED ROOF TRUSSES

James M. Potter, 1000 E. Butler Ave., Flagstaff, Ariz.

Filed Feb. 14, 1969, Ser. No. 799,361
Int. Cl. E04h *1/12;* **E04b** *1/34*
U.S. Cl. 52—73 **4 Claims**



A system of mass producing low cost buildings in a central production plant by conveying the buildings through the production assembly stages, transporting the buildings to the permanent location and placing the building on permanent support piers.

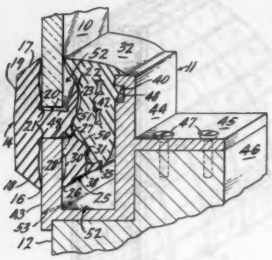
3,571,994
GLAZING GASKET

Howard R. Brown, Bowling Green, Ohio, and Michael C. Rizza, Walnut Creek, Calif., assignors to The D.S. Brown Company, North Baltimore, Ohio

Filed Mar. 12, 1969, Ser. No. 806,561
Int. Cl. E06b *7/14, 3/62*
U.S. Cl. 52—209 **9 Claims**

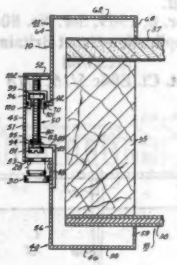
A resilient glazing gasket for positioning and sealing window panes within a rigid channel frame. The gasket, in cross section, has an outer strip and a normally extending intermediate web to be positioned between the pane and one edge of channel leg. A deformable locking flange extending from the intermediate web is adapted to be slipped past the edge of the channel leg and then pushed into the channel by a wedge which is forced into locking position between one side

of the glass pane and the other channel leg. The wedge and locking flange include complementarily shaped configura-



tions which engage with each other to hold the wedge and locking flange in position within the channel.

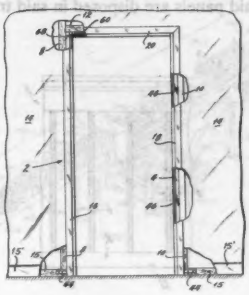
3,571,995
ADJUSTABLE DOORFRAME
David P. Kasprzak, Largo, Fla., assignor to The Celotex Corporation, Tampa, Fla.
Filed Aug. 19, 1968, Ser. No. 753,455
Int. Cl. E06b *1/22*
U.S. Cl. 52—212 **4 Claims**



An adjustable doorframe with concealed adjusting and securing means can be used to finish walls of different thicknesses. The doorframe comprises two elongated portions which are arranged to be transversely telescoping with respect to one another and adjustable by means of a bolt and bolt locking means which prevent separation of the two elongated portions after factory assembly. Two vertical doorframes and a horizontal header connected along beveled ends complete the full doorframe assembly in actual installations.

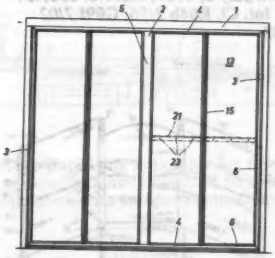
3,571,996
DOORFRAME
Claude Richard Braswell, Ballwin, Mo., assignor to Mesker Brothers Industries, Inc., St. Louis, Mo.
Filed Apr. 7, 1969, Ser. No. 814,073
Int. Cl. E06b *1/12, 1/60*
U.S. Cl. 52—217 **10 Claims**

A doorframe for installation in a rough door opening and including channellike jambs and a header, the former being connected to the latter at their upper ends. A positioning assembly is mounted in the channellike portion of the header and includes a slide element which can be extended outwardly over one of the jambs and into engagement with the stud covered by that jamb. The laterally directed force applied by the slide element is transferred through the header



to the opposite jamb and the stud covered by it, thereby securing the doorframe firmly in place.

3,571,997
WING FOR AT LEAST PARTLY CLOSING A WALL OPENING
Ludwig Lindpointner, Hart 69, Leonding, Austria
Filed Mar. 12, 1969, Ser. No. 806,666
Int. Cl. E04c *7/34, 2/38;* **E06b** *3/24*
U.S. Cl. 52—309 **10 Claims**

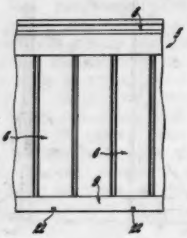


A metal frame is composed of frame members consisting of extruded sections and connected by plug connections. The frame members have inner side portions which define a frame opening. Each of said side portions carries at least two edge lips projecting into said frame opening. The wing also comprises paneling which covers said frame opening and is held in position between and by said edge lips.

3,571,998
MOBILE HOME SKIRTING
Marco J. Iacona, 42260 Utica Road, Utica, Mich.
Filed Nov. 12, 1968, Ser. No. 774,845
Int. Cl. E04d *2/38*
U.S. Cl. 52—478 **3 Claims**

Mobile home skirting is disclosed comprising a top track, a bottom track and a plurality of panels in said tracks, each track having a front wall and a backwall, each panel having a major portion forming a front wall thereof and a minor portion forming a backwall thereof, said panels arranged in edge-overlapping and independently vertically slidable relationship to each other when disposed in said tracks with the front and back walls of the panels in contact, respectively, with the front and back walls of said tracks, the front wall of each panel and the front wall of each track both being formed with mutually engageable locking means for retaining said panels in said tracks, the backwall of each panel and the backwall of each track both being formed for free engage-

ment relative to each other, said panels being vertically slidable in said tracks when the bottom track moves vertically in respect to the top track on account of weather changes, each panel being vertically slidable independently of the other panels when said panels are disposed in said tracks for installation or disassembly of said panels in respect to said tracks, the front wall of each panel capable of being flexed in respect to the front wall of each track so as to release said locking means to permit removal of said panel from the front side of said mobile home skirting.

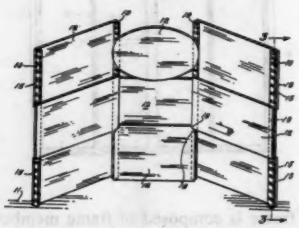


3,571,999

KNOCKDOWN DISPLAY

John G. Downing, c/o Downing Displays 300 Gennessee St., Cincinnati, Ohio

Filed July 2, 1969, Ser. No. 838,437
Int. Cl. E04b *2/56*; **G09f** *7/02*
U.S. Cl. 52—483 **5 Claims**



A display having a set of sectionalized supporting standards and a set of supported panels adapted to be connected together to form the display by a two-part pressure engaged separable fastener means, the pieces in each set having bonded thereto one of the separable fastener parts.

3,572,000

MOUNTING OF EXTERIOR SURFACE CLADDING FOR TANKS OR SIMILAR STRUCTURES

Karl-Axel Albert Gustavsson, Goteborge, Sweden, assignor to Entreprenadisolering AB,, Goteborg, Sweden

Filed June 25, 1969, Ser. No. 836,459
Claims priority, application Sweden, July 4, 1968, 9204/68
Int. Cl. E04b *2/40, 1/68*
U.S. Cl. 52—486 **7 Claims**

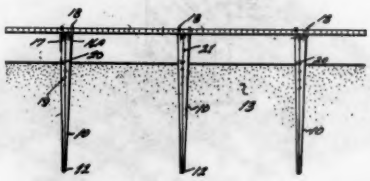
A bracket for supporting surface coatings on tanks and similar buildings, this bracket extending perpendicularly out from the wall of the building and carrying at its outer end an essentially horizontal rail. This rail extends in front of and at a distance from the wall of the building to which there are attached a protection surface forming said surface coating. The invention resides in the arrangement of carrying arm arranged on said bracket and being vertically displaceable in relation to the same. The carrying arm is further, at its outer end, provided with at least one hook, this hook carrying a second horizontal rail, a lower row of protection sheets adapted to be arranged at said second horizontal rail.

3,572,001

SUPPORT FOR CONCRETE REINFORCING STEEL

Oldrich Munchinsky, General Delivery, Outlook, Saskatchewan, Calif.

Filed Apr. 6, 1969, Ser. No. 804,861
Claims priority, application Great Britain, July 12, 1968, 33253/68
Int. Cl. E04c *5/16, 5/18*
U.S. Cl. 52—678 **1 Claim**



An elongated support for concrete reinforcing steel which can be driven into the sub-base and which is provided with a slot in the upper end to receive the steel and support same. The upper end portions bounding the slot are then bent over to secure the steel in place.

3,572,002

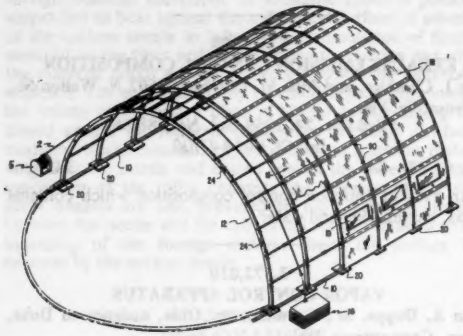
METHOD OF ERECTING PREFABRICATED BUILDING

Walter B. Nichols, 77 Lounsbury Road, Trumbull, Conn.

Continuation-in-part of application Ser. No. 631,799, Apr. 18, 1967, now abandoned. This application Aug. 4, 1969, Ser. No. 847,010
Int. Cl. E04b *1/35*; **E04g** *21/14*
U.S. Cl. 52—741 **13 Claims**

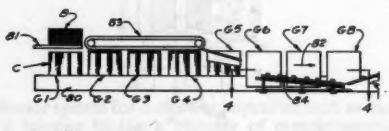
A method of erecting a prefabricated portable building comprising the step of placing elongated base sills or the ground site in laterally spaced and parallel relationship, hinging a plurality of superstructure ribs to the sills at intervals spaced along the sills, attaching purlins between adjacent ribs using fasteners prefabricated thereon, and securing a plurali-

ty of foldable panel units to the ribs in overlying relationship



with the purlins using releasable wedge assemblies prefabricated on the ribs.

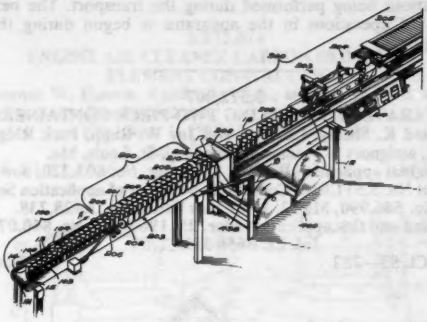
3,572,003
PACKAGING MACHINE AND METHOD
John H. Perry, Doraville, and Harry A. Fawcett, Stone Mountain, Ga., assignors to The Mead Corporation
Filed Sept. 13, 1968, Ser. No. 759,719
Int. Cl. B65b *11/08*
U.S. Cl. 53—3 **8 Claims**



A packaging machine for securing a wrapper-type blank about a group of articles is provided with a continuously movable tucking stud mounted on an endless conveyor element whose working reach is disposed alongside the path of movement of a group of articles and an associated blank, said stud being engageable with a pair of article retaining and blank reinforcing flaps so as to fold such flaps inwardly of the blank to positions of enveloping relationship relative to an article. Guides are arranged so as to complete the folding of the blank in such manner as to force the flaps into secure article gripping relationship relative to the article and thereafter the ends of the blank are folded underneath the group of articles and secured together.

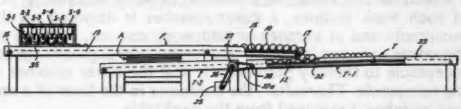
3,572,004
PACKAGING APPARATUS
Keith Stewart Carmichael, Wilmington, Del., assignor to E.I. du Pont de Nemours and Company, Wilmington, Del.
Filed July 15, 1968, Ser. No. 744,848
Int. Cl. B65b *53/02*
U.S. Cl. 53—48 **4 Claims**

An apparatus for packaging articles such as cans in an overwrap of thermoplastic polymeric material is provided wherein said apparatus comprises means for grouping a plurality of articles to be packaged, means for enwrapping said articles with said film, means for heat sealing overlapped edge portions of said film and enclosing said articles therewithin, means for separating said film-enwrapped grouped articles, and means for shrinking said heat-sealed film to provide a package of grouped articles characterized by a substantially wrinkle-free film extending over the top,



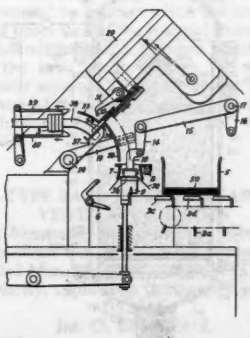
bottom, sides and portions of the ends of said grouped articles.

3,572,005
AUTOMATIC PACKAGING APPARATUS
Lloyd E. Allen, Harlingen, Tex., and Lawrence W. McCracken, Morristown, N.J., assignors to Tri-Pak Machinery Services Inc. and Keyes Fibre Company, a fractional part interest to each
Filed June 11, 1969, Ser. No. 832,388
Int. Cl. B65b *35/44*
U.S. Cl. 53—160 **9 Claims**



An automatic packaging apparatus for rapidly, accurately and gently packing randomly oriented objects, such as fresh fruits and vegetables, into compartmented trays.

3,572,006
DEVICE FOR WRAPPING ARTICLES
Marcel Demierre, Chavannes, Switzerland, assignor to Sapal Societe Anonyme des Plieuses Automatiques, Vaud, Switzerland
Filed Dec. 19, 1967, Ser. No. 691,754
Claims priority, application Switzerland, Dec. 30, 1966, 18800/66
Int. Cl. B65b *11/38*
U.S. Cl. 53—225 **4 Claims**



Method and apparatus for wrapping flat articles wherein each article with its wrapping material is pushed through a

folding tunnel for the purpose of partially folding the wrapping material about the article, and each article is then transported to a final folding station; additional folding operations being performed during the transport. The next cycle of operations in the apparatus is begun during this transport.

3,572,007

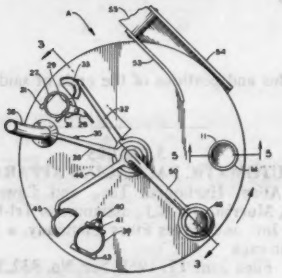
APPARATUS FOR SEALING TWO-PIECE CONTAINERS

Richard K. Shelby, Chicago, and Jay W. Rapp, Park Ridge, Ill., assignors to Monsanto Company, St. Louis, Mo.

Original application Dec. 20, 1966, Ser. No. 603,220, now Patent No. 3,511,018, Continuation-in-part of application Ser. No. 546,990, May 2, 1966, now Patent No. 3,428,238. Divided and this application Mar. 25, 1969, Ser. No. 840,072

Int. Cl. B65b *3/06, 1/06*

U.S. Cl. 53—282 **16 Claims**



An apparatus for permanently sealing a plastic cover member to a plastic receptacle. The receptacle is disposed in a worktable and moved to a plurality of work stations. At one of such work stations, a cover member is disposed on the receptacle and at another of said work stations, a flange on the cover member is heated and urged into a groove on the receptacle to thereby permanently seal the cover member to the receptacle. Thereafter, the container in the form of a unitary member is removed from the worktable.

3,572,008

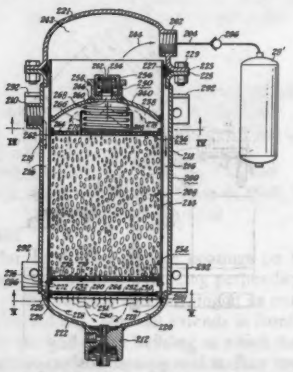
METHODS AND MEANS FOR CLEANING AND DRYING COMPRESSED FLUID SYSTEMS

Paul M. Hankison, Peters Township, Washington County, and William Foster Walker, Bethel Park, Pa., assignors to Hankison Corporation, Canonsburg, Pa.

Continuation-in-part of application Ser. No. 637,860, Feb. 10, 1967, now Patent No. 3,464,186, which is a continuation-in-part of application Ser. No. 547,115, Mar. 22, 1966, now abandoned , which is a continuation-in-part of application Ser. No. 445,639, Apr. 5, 1965, now abandoned. This application Oct. 25, 1968, Ser. No. 770,626

Int. Cl. B01d *53/04*

U.S. Cl. 55—33 **14 Claims**



We disclose methods and means for separating gaseous materials including vaporized moisture and for regenerating the gas separator or absorbent used for this purpose. We also disclose methods and means for separating a contaminant liquid from the aforementioned or other fluid systems and for regenerating the liquid separator thus employed.

3,572,009

EXHAUST EMISSION CONTROL COMPOSITION

Elza I. Cheshire, and Mae M. Cheshire, 5602 N. Walton St., Pensacola, Fla.

Filed Dec. 24, 1969, Ser. No. 888,065

Int. Cl. B01d *47/00*

U.S. Cl. 55—84 **3 Claims**

An exhaust emission control composition which contains borax, baking soda and water.

3,572,010

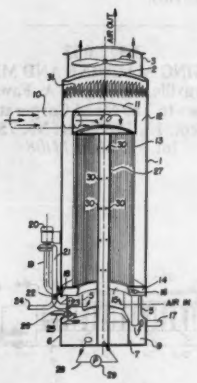
VAPOR CONTROL APPARATUS

John A. Dupps, Sr., Germantown, Ohio, assignor to Duke, Inc., Germantown, Ohio

Filed Aug. 4, 1969, Ser. No. 847,269

Int. Cl. B01f *3/04*

U.S. Cl. 55—222 **10 Claims**



Vapor control apparatus embodying in a single unit the combined functions of a shell and tube condenser, a condensing water cooling tower, and an air scrubber.

3,572,011

FILTERING APPARATUS FOR GASEOUS MEDIA

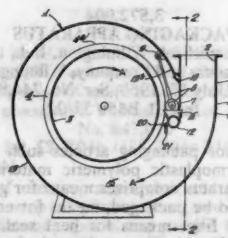
Gunnar Wilhelmsson, Vaxjo, Sweden, assignor to Aktiebolaget Svenska Flaktfabriken, Stockholm, Sweden

Filed Sept. 17, 1969, Ser. No. 858,790

Claims priority, application Sweden, Sept. 20, 1968, 12,680

Int. Cl. B01d *50/00*

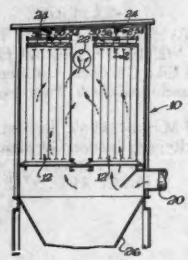
U.S. Cl. 55—290 **3 Claims**



Filtering apparatus having rotatably mounted filter drum with a cylindrical filter surface mounted within a volute cas-

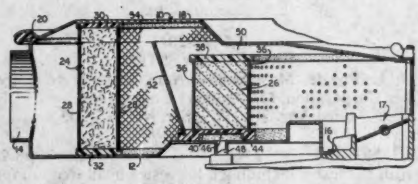
ing whose inlet directs dirt-laden medium against the exterior of the filter surface and whose outlet withdraws clean medium from the interior of the drum. The suction nozzle has a suction gap directed toward the filter surface to remove foreign material therefrom. A rotatable roller is pivotally suspended to bear against the cylindrical surface in advance of the suction nozzle to follow the accumulation of foreign material on the filter surface, enlarging the suction gap when the material builds up and reducing it when the material is depleted. The nozzle is fixedly mounted adjacent the inlet of the volute casing and a plate is hinged to the casing and biased against the roller to deflect the incoming dirt-laden medium circumferentially of the drum and a similar plate is hinged to the nozzle and biased against the roller to permit movement of the roller changing the opening of the slot. Blow nozzles are also provided to blow gaseous medium between the nozzle and the cylindrical surface to assist in the loosening of the foreign material from the surface for removal by the suction nozzle.

3,572,012
DUST COLLECTOR
Charles T. Martin, and Vincent E. Schoeck, Hagerstown, Md., assignors to The Carborundum Company, Niagara Falls, N.Y.
Filed Nov. 20, 1968, Ser. No. 777,294
Int. Cl. B01d *46/04*
U.S. Cl. 55—304 **9 Claims**



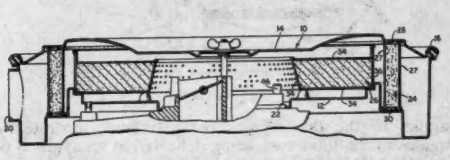
A collector system for collecting impurities such as dust includes a housing having a plurality of compartmentalized filter bags and a shaker for causing the impurities to fall from the bags into collecting means at the bottom of the bags. At least one rod is secured within the top of each bag and has a plurality of exposed hooks slidably mounted upon a support tube disposed above the bags in a direction transverse to the compartments of each bag. The tube and hooks have complementary noncircular shapes and the tube is secured to the shaker mechanism to transmit its movement to the bags.

3,572,013
FUEL VAPOR EMISSION CONTROL
Gunnar W. Hansen, Ypsilanti, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Oct. 22, 1968, Ser. No. 769,584
Int. Cl. B01d *50/00*
U.S. Cl. 55—316 **6 Claims**



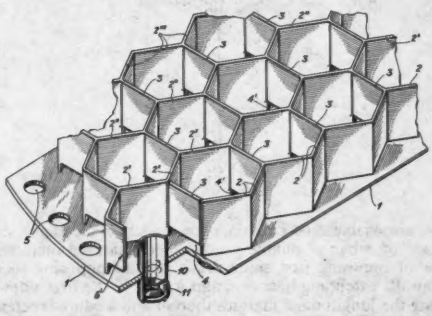
An engine air cleaner has a ringlike carbon bed filter element to absorb fuel vapors, a baffle member assuring saturation of the filter before vapor breakthrough to the atmosphere, the filter element being desorbed or purged of the vapors during normal air flow through the air cleaner.

3,572,014
ENGINE AIR CLEANER CARBON BED FILTER ELEMENT CONSTRUCTION
Gunnar W. Hansen, Ypsilanti, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Nov. 1, 1968, Ser. No. 772,684
Int. Cl. B01d *50/00*
U.S. Cl. 55—316 **8 Claims**



An engine air cleaner has an axial flow fuel vapor filter element of activated carbon, the element having an annular baffelike solid sidewall and perforated screens for the remaining walls; alternately, more than one wall is formed of solid material to restrict fuel vapor breakthrough either to the atmosphere or to the carburetor.

3,572,015
WATER SEPARATOR FOR SATURATED-STEAM GENERATORS
Alfred Brunner, Winterthur, Switzerland, assignor to Sulzer Brothers, Ltd., Winterthur, Switzerland
Filed May 23, 1968, Ser. No. 731,419
Claims priority, application Switzerland, May 31, 1967, 7697/67
Int. Cl. B01d *45/12*
U.S. Cl. 55—347 **7 Claims**

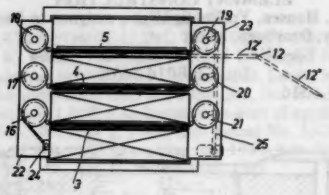


The tube sections containing the twist-producing elements are each surrounded by a jacket which has an internal diameter at least 1.5 times that of the internal diameter of the tube section and extends at least a distance equal to the internal diameter of the tube section above the tube section to receive the water separated from the steam. Outlets are provided at the base of the jackets to allow the water to run off out of the path of the dried steam.

3,572,016
ROLL-TYPE BAND FILTER SUITABLE FOR VENTILATING DUCTS
Gerhard Max Neumann, Berlin-Dahlem, Germany, assignor to Delbag Luftfilter G.m.b.H., Berlin, Germany
Filed Mar. 22, 1968, Ser. No. 715,233
Claims priority, application Germany, Apr. 14, 1967, D52813
Int. Cl. B01d *46/18*
U.S. Cl. 55—353 **7 Claims**

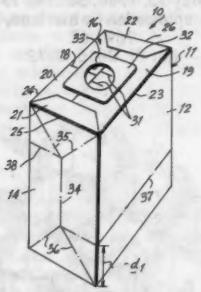
Conventional roll-type band filters for filtering for example air in ventilating ducts, comprise a drawoff roller and a

takeup roller for a filter band, the band being from time-to-time rolled up to expose a fresh surface. Considerable space may be saved by the arrangement of the invention, in which a filter case is provided for insertion in the duct, which case contains two or more filter bands disposed substantially



parallel to the flow of gas being filtered, separated gas streams in the filter case being deflected at an angle to pass through one of the filter bands. In a particular embodiment one or more of the filter bands are contained in replaceable magazines for insertion in the filter case.

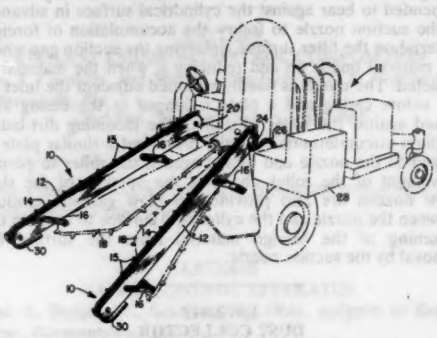
3,572,017
DISPOSABLE DUST CONTAINERS FOR SUCTION CLEANERS
Dominick Terzuoli, 2258 E. 70 St., Brooklyn, N.Y.
Filed Oct. 23, 1969, Ser. No. 868,793
Int. Cl. B01d *46/02*
U.S. Cl. 55—367 **8 Claims**



A disposable dust container for a suction cleaner is comprised of a bag of pliable porous sheet material including a pair of opposing first sidewalls, a pair of opposing second sidewalls extending between, and joined to the first sidewalls along the longitudinal margins thereof and a pair of rectangular end walls at the opposite ends of the bag and each being joined, at its periphery, to the first and second sidewalls to give to the bag substantially the form of a cuboid. The sidewalls of the bag are folded so that the second sidewalls are creased inwardly between the first sidewalls and so that the rectangular end walls lie flat against opposite sides of the bag at opposite ends of the bag. The thus folded bag is self-opening to the cuboid form when dust-laden air is admitted to the interior of the bag through an opening in one of its end walls or one of its first sidewalls in response to the application of suction to the exterior of the bag.

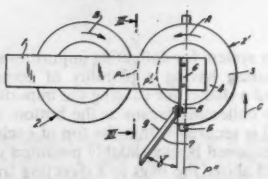
3,572,018
ATTACHMENT TO SUGAR CANE HARVESTER
Vernon P. Broussard, P.O. Box 227, St. Martinville, La.
Filed Feb. 17, 1969, Ser. No. 799,768
Int. Cl. A01d *45/02, 45/10*
U.S. Cl. 56—119 **3 Claims**

Two tracks having rounded ends respectively mounted by swing bars outboard of and partially extended forward of and to upright-cane gathering apparatus having sticker chains with stickers extending in transverse planes for gathering standing cane, said swing bars being adapted to swing in vertical planes to allow the lower ends of the tracks to rest on and move over uneven ground, and endless sticker chains



adapted to travel on said outboard tracks with the stickers extending in planes normal to the stickers of the upright-cane gathering apparatus, for gathering fallen cane in approximately horizontal position.

3,572,019
ROTARY MOWER WITH DEFLECTING PLATE FOR WINDROW FORMATION
Josef Glunk, and Eike Gusewell, Gottmadingen, Germany, assignors to Maschinenfabrik Fahr A. G., Gottmadingen, Germany
Filed May 14, 1969, Ser. No. 824,405
Claims priority, application Germany, May 16, 1968, P 17 57 497.9
Int. Cl. A01d *57/26*
U.S. Cl. 56—192 **11 Claims**



A rotary mower has at least two mower assemblies each with a vertical cylindrical drum bearing at its lower end a plurality of outwardly projecting blades. These drums are mounted below a support beam and rotated in opposite directions about their axes so as to cut a standing crop and then project it back between them. A deflecting plate is mounted behind at least one of the assemblies on the support and has a bent over forward edge which lies immediately adjacent to the body and the blade orbit and extends counter to the sense of rotation of the mower. This plate can pivot upwardly freely to prevent blockages and is inclined to the direction of travel of the mower to form a windrow from the rearwardly cast crop material.

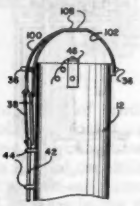
3,572,020
FRUIT HARVESTER
Joseph L. Poggie, Massapequa, N.Y., assignor to Fairchild Hiller Corporation, Montgomery County, Md.
Filed Apr. 28, 1969, Ser. No. 819,705
Int. Cl. A01g *19/08*
U.S. Cl. 56—332 **6 Claims**

A fruit harvester including a harvester head that comprises a hollow housing, a hollow cylindrical rotor rotatably mounted within the housing and means such as an air drive for causing the rotor to rotate. The hollow cylindrical rotor has ridges on its interior surface that strike the fruit that is to

be harvested when the rotor rotates and causes the fruit to spin about its stem and be severed from the tree. A guide fence is included for placement on top of the fruit harvester head to guide the fruit into the harvester head and to keep

the fruit from being thrown out of the harvester head. A flexible tube is provided for connection to the lower end of the fruit harvester head to transport the severed fruit from the harvester head.

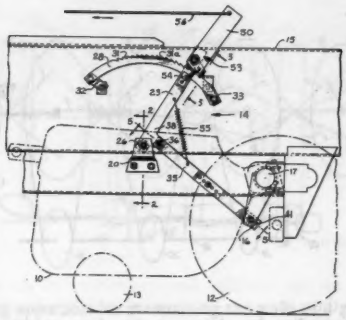
3,572,021
FRUIT PICKER
Samuel A. McDonald, 626 S. Banana River Drive, Merritt Island, Fla.
Filed Sept. 29, 1969, Ser. No. 861,920
Int. Cl. A01g *19/08*
U.S. Cl. 56—334 **18 Claims**



An electrically actuated, stem severing fruit picker including an elongated tube, having a handle on one end, and a pair of pivoting cutting jaws on the other end, and a fruit contact switch wired to a solenoid system for activating the cutting jaws. A circuit breaker is included to unjam the cutting jaws, should the fruit stem remain unsevered after the first cutting attempt, which causes repeated closing and opening of the jaws until the fruit stem is severed. The noncutting edges of the cutting jaws are recessed, thereby allowing perfect mating of the cutting portions. Segments of the jaw cutting edges are flattened for more perfect cutting of the fruit stem. A control rod is secured to the jaws and the electrical actuation system, and the jaws may be arranged so that either an upward or downward movement of the control rod will cause the cutting jaws to close. The tube includes means for selectively retaining and releasing severed fruit therefrom.

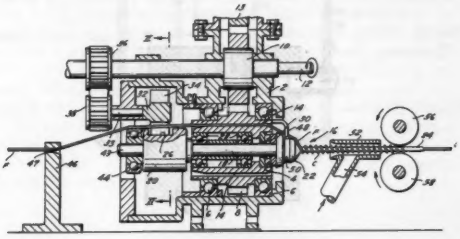
3,572,022
BALER PICKUP HEIGHT ADJUSTING MECHANISM CAPABLE OF REMOTE ACTUATION
Charles A. Smith, New Holland, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.
Filed Aug. 1, 1969, Ser. No. 846,664
Int. Cl. A01f *15/04*
U.S. Cl. 56—341 **7 Claims**

A height adjusting mechanism on the side of a baler has a link connected between a bracket rigidly attached to the rotatable baler pickup support and a lever pivotally mounted on the baler. The lever has a toggle pivotally mounted at the opposite end of the lever from the pivot. The toggle has a pawl engageable with a ratchet rack curved about the lever pivot and a stop engaging the lever to move the lever opposite to the ratchet rack for raising the pickup and permitting the lever to swing back to the pickup in the lowest



position or intermediately engaging the pawl with the ratchet rack for intermediately positioning the pickup. The toggle may be remotely operated by a cable. A lost motion slot is provided between the link and bracket and a spring between the link and lever permits the lever to be set at positions beyond the lost motion slot when the pickup is otherwise held to preset the pickup height.

3,572,023
COILING APPARATUS
Walter O. Galonska, Great Neck, N.Y., assignor to Henry Rogers, New York, N.Y.
Filed Jan. 23, 1969, Ser. No. 793,363
Int. Cl. B29d *5/00*
U.S. Cl. 57—1 **15 Claims**

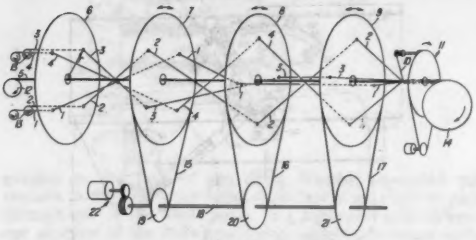


A coiling apparatus, especially for forming plastic filaments into coils for use in slide fasteners in which a rotor having a guide passage parallel to and radially displaced from the axis of the rotor coils a filament passing through the guide passage onto a mandrel which is supported in and extends axially through the rotor and in which means engaging the mandrel are provided which prevent rotation of the mandrel during turning of the rotor about its axis without obstructing coiling of the filament about the mandrel.

3,572,024
MANUFACTURE OF ELECTRIC CABLES
Eric Lyons, St. Helens, England, assignor to British Insulated Callenders Cables Limited, London, England
Filed Oct. 31, 1968, Ser. No. 772,106
Claims priority, application Great Britain, Nov. 1, 1967, 49 655/67
Int. Cl. B65h *81/08*
U.S. Cl. 57—3 **10 Claims**

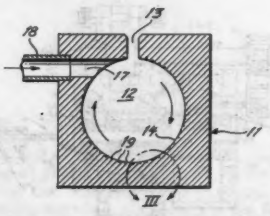
In the manufacture of an electric cable, a layer of wires is applied to an advancing core by a method comprising draw-

ing the wires through a fixed lay plate, at least two intermediate lay plates and a final lay plate, and then bringing them into engagement with the core. The final lay plate is caused to oscillate about the core through an angle greater than 720°, each half-cycle of its oscillation comprising a major part during which the angular velocity of the lay plate has a substantially uniform value and a minor part during which its angular velocity is greater than that uniform value.



The intermediate lay plates are caused or permitted to oscillate at the same frequency as and in phase with the final lay plate, the amplitude of each oscillating lay plate exceeding that of the preceeding lay plate by less than 360°. In the resulting layer each of the wires extends about the core in a helical path which reverses its circumferential direction at intervals spaced apart along the length of the core by a distance which is at least twice the length of lay of the wires about the core.

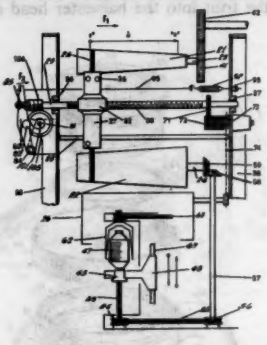
3,572,025
STRAND SPLICER
Malcolm F. Irwin, West Chester, Pa., assignor to Techniservice Corporation, Kennett Square, Pa.
Filed June 30, 1969, Ser. No. 837,509
Int. Cl. B65h *69/06*
U.S. Cl. 57—22 **6 Claims**



Splicer apparatus for textile strands is provided with a strand-receiving chamber having its interior wall striated longitudinally thereof and transversely of a communicating fluid-receiving axis.

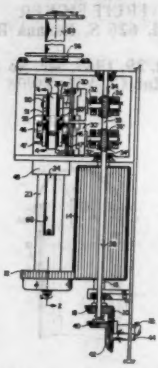
3,572,026
DRIVE CONTROL FOR ROVING FRAME
Jean Frederic Herubel, Guebwiller, France, assignor to N. Schlumberger & Cie, Guebwiller, France
Filed Mar. 10, 1969, Ser. No. 805,786
Claims priority, application France, Mar. 12, 1968, 143379
Int. Cl. D01h *1/04*
U.S. Cl. 57—96 **12 Claims**

A control for winding yarn in textile machines to rotate the bobbin at a speed which is inversely proportional to the diameter of the yarn wound on the bobbin including: a pair of cone pulleys with a transmission axially slidable with respect thereto and guided through a carriage. The carriage is threadedly engageable with an axially displaceable threaded member which in turn is connected to a compensating means whereby rotation of the cones axially displaces the threaded member through the belt and carriage, and this displacement is amplified by the compensating means thereby



effecting the output of the pulley transmission and the rotational speed of the bobbin.

3,572,027
TEXTILE SPINDLE ASSEMBLY
Christoph W. Aurich, Clemson, S.C., assignor to Maremont Corporation, Chicago, Ill.
Filed June 30, 1969, Ser. No. 837,807
Int. Cl. D01h *1/24, 1/36*
U.S. Cl. 57—99 **14 Claims**

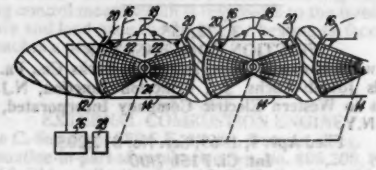


An elongate flexible belt entrained about guide rollers and about two drive rolls alternately rotated in opposite directions reciprocates a spindle vertically as it is simultaneously rotated about its axis. The drive rolls are rotated from a common input shaft through oppositely threaded pairs of worm and worm gears and selectively energizable clutches. A gear affixed to the spindle meshes in all its reciprocatory positions with an elongate gear which is driven to rotate the spindle about its axis.

3,572,028
BLADE INGESTION PREVENTION
Maurice I. Taylor, Allestree, England, assignor to Rolls Royce Limited, Derby, England
Filed Sept. 16, 1969, Ser. No. 858,310
Claims priority, application Great Britain, Sept. 26, 1968, 45 754/68
Int. Cl. F02c *7/04*; B64d *33/02*
U.S. Cl. 60—39.09 **5 Claims**

The invention provides an apparatus for either preventing an engine component from flying out of an engine or preventing a foreign body from entering an engine and is particularly applicable to each engine of a bank of gas turbine lift engines. The apparatus consists of detecting means which comprises a photoelectric scanner mounted centrally in the intake of a gas turbine engine and a ring of photoelectric

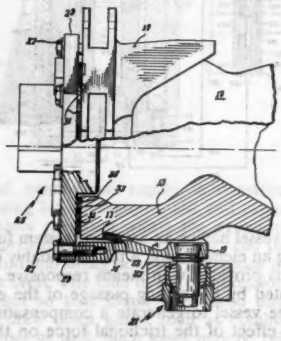
cells spaced around the engine intake wall and a guard means which comprises a pair of part spherical gridlike shields having a power source operable by the detecting means to span the intake.



3,572,029
ROCKET ENGINE THRUST CHAMBER ATTACHMENT MEANS

Arthur P. Swift, Jr., Woodland Hills, Calif., assignor to the United States of America, as represented by the Secretary of the Air Force

Filed Sept. 4, 1969, Ser. No. 855,232
Int. Cl. F02c *7/20*
U.S. Cl. 60—39.32 **4 Claims**

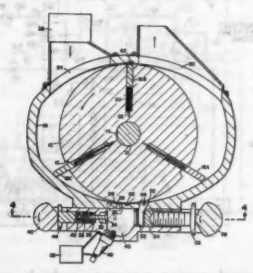


A yieldable mounting ring of teardrop cross section is mounted between a solid wall rocket engine thrust chamber wall and a sleeve holding the gimbal assembly which provides for the thrust direction control capability of the engine. The ring is segmented to expand and contract and allow unrestricted dimensional changes in the thrust chamber while maintaining the chamber in alignment with any attached structural elements.

3,572,030
ROTARY ENGINE ASSEMBLY

James D. Cuff, 2632 Valleybrook Drive N.E., Huntsville, Ala.

Filed Dec. 26, 1968, Ser. No. 787,053
Int. Cl. F02c *3/00*
U.S. Cl. 60—39.61 **3 Claims**

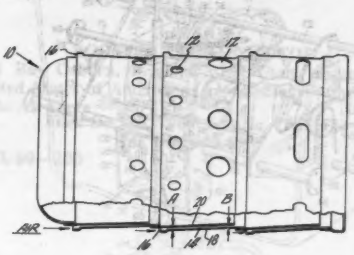


A rotary internal combustion engine having a combustion chamber or chambers located exterior to the compression and expansion areas of the engine.

3,572,031
VARIABLE AREA COOLING PASSAGES FOR GAS TURBINE BURNERS

Eugene J. Szetela, South Windsor, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed July 11, 1969, Ser. No. 840,954
Int. Cl. F02c *7/18*
U.S. Cl. 60—39.65 **1 Claim**

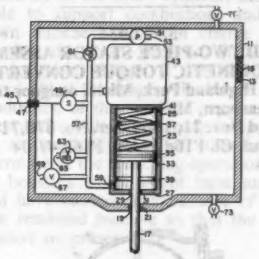


A cooling apparatus for maintaining the walls of a gas turbine burner within acceptable temperature limits. Cooling air which is also used for combustion is passed through variable cross-sectional area cooling passages in the "Thermal Skin$_{TM}$" walls of the burner to maintain a constant temperature distribution along the walls.

3,572,032
IMMERSIBLE ELECTROHYDRAULIC FAILSAFE VALVE OPERATOR

William M. Terry, 2624 Carolina Way, Houston, Tex.

Filed July 18, 1968, Ser. No. 745,896
Int. Cl. F15b *15/18*
U.S. Cl. 60—52 **5 Claims**



An electrohydraulic valve operator for remote undersea operation in which all the working components are immersed in hydraulic fluid and maintained at ambient hydrostatic pressure. A spring or other biasing means is used to provide fail-safe operation.

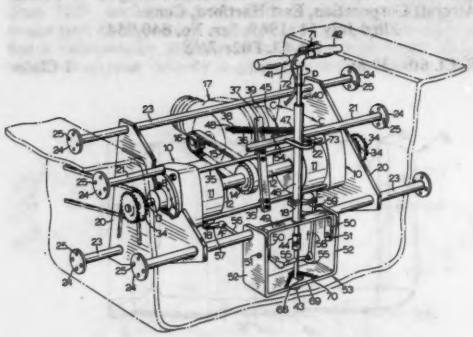
3,572,033
POWER TRANSMISSION APPARATUS

Noel Partick Tolley, Scarborough, Ontario, Canada, assignor to Dowty Equipment of Canada Limited, Ajax, Ontario, Canada

Filed Sept. 5, 1969, Ser. No. 855,636
Int. Cl. B60k *29/00*; **G05g** *9/00*
U.S. Cl. 60—53 **11 Claims**

Power transmission apparatus for use in a vehicle, the apparatus comprising two coaxially disposed hydrostatic transmission units each of which consists of a variable displacement hydraulic pump and a fixed displacement hydraulic motor, fluid from the pump, the input shaft of which is driven by an engine, serving to operate the motor. The housings of the units are journaled for turning movement about the axis of rotation of the output shafts of the units and a coil compres-

sion spring arrangement is provided for applying to the housings a balancing torque which counterbalances the reaction



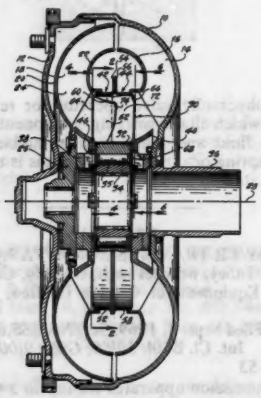
torque on the housings during operation of the apparatus, this reaction torque causing turning of the housings of the units so that the angular orientation of the housings is dependent on the magnitude of the reaction torque. The variable displacement setting of the pump of each transmission unit is so dependent on the angular orientation of the housings, which are interconnected to prevent relative rotation therebetween, that variation in the reaction torque on the housings results in a corresponding variation in the output torque which can be supplied by the output shafts, with a corresponding variation, in the opposite sense, in the speed of rotation thereof. The setting of the coil compression spring arrangement is adjustable to vary the magnitude of the balancing torque applied to the housings, and a steering assembly is provided so to vary the variable displacement setting of the pumps as to cause differential rotation of the wheels on the opposite sides of the vehicle in which the apparatus is installed, with resultant turning of the vehicle.

3,572,034

FABRICATED TWO-PIECE STATOR ASSEMBLY FOR HYDROKINETIC TORQUE CONVERTERS

Alan R. Fisher, Highland Park, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 21, 1969, Ser. No. 878,718
Int. Cl. F16d *31/06*; F16h *41/04*
U.S. Cl. 60—54 **15 Claims**



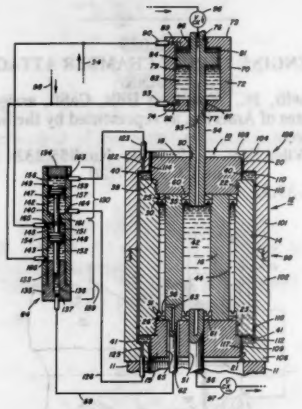
A bladed stator assembly comprising two circular bladed sections situated in adjacent relationship, each section complementing the other, one section defining a fluid flow entrance region and the other section defining a fluid flow exit region, and radially displaced blades, each blade including a leading edge portion integrally formed on one stator section and a trailing edge portion integrally formed on the other stator section.

3,572,035

FRICTION COMPENSATOR

John Edward Beroset, Alsace Township, Berks Co., Pa., and Francis Joseph Fuchs, Jr., Princeton Junction, N.J., assignors to Western Electric Company Incorporated, New York, N.Y.

Filed Apr. 1, 1969, Ser. No. 812,205
Int. Cl. F15b *7/00*
U.S. Cl. 60—54.6 **7 Claims**



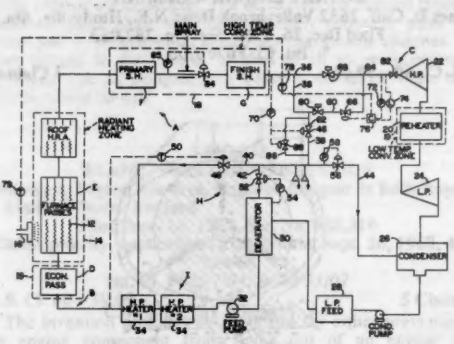
A pressure vessel having an actuating system for advancing and retracting an element, e.g. a piston, slidably into and out of the vessel is provided with means responsive to frictional forces generated by the sliding passage of the element into and out of the vessel to generate a compensating force for opposing the effect of the frictional force on the actuating system.

3,572,036

VAPOR GENERATOR START-UP SYSTEM

Eugene B. Beckman, Rockaway Township, and Raymond M. Costello, Parsippany, N.J., assignors to Foster Wheeler Corporation, Livingston, N.J.

Filed Oct. 21, 1968, Ser. No. 769,097
Int. Cl. F01k *3/14*
U.S. Cl. 60—104 **13 Claims**



A once-through vapor generator which comprises a main flow path including heating surfaces, and a bypass system comprising a first conduit connected to the outlet end of said heating surfaces including a pressure-reducing means therein,

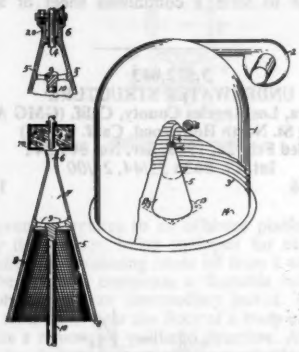
and a second conduit leading from the inlet side of said pressure reducing means back to the main flow path connected to the latter at a point downstream of said first conduit. The second conduit also contains a pressure-reducing means, including control means which is responsive to the turbine inlet pressure and load once the flow at the heating surfaces outlet end reaches a preset temperature.

3,572,037

EXTERNAL COMBUSTION ENGINE

Goerge C. Sorensen, 589 S.E. 4th St., Ontario, Oreg.

Continuation-in-part of application Ser. No. 800,200, Feb. 18, 1969. This application May 12, 1969, Ser. No. 825,131
Int. Cl. F01d *1/02*; F22b *27/08*
U.S. Cl. 60—108 2 Claims



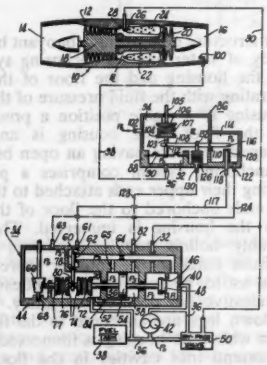
An external combustion engine is constructed with a rotatable housing having compression and expansion chambers and a stator mounted within the expansion chamber. The stator is provide with a helical crest, and the expansion chamber, an internal lining adapted to oppose cyclonic flow created by the crest. The inlet to the compression chamber is venturi in effect so that steam introduced directly to the chamber can draw other gases, such as combustion gases, into the chamber as well. Such gases may be relied upon to superheat the steam within the compression chamber.

3,572,038

THRUST CONTROL MECHANISM

Samuel E. Arnett, South Bend, Ind., assignor to The Bendix Corporation

Filed July 29, 1968, Ser. No. 748,416
Int. Cl. F02k *3/00*; F02c *9/08*
U.S. Cl. 60—243 7 Claims



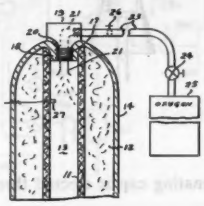
A thrust control mechanism for use in association with a combustion engine having a valve means to control the flow of fuel to said combustion engine upon command, which is responsive to a pressure responsive member for sensing thrust as a function of the pressure drop across said combustion engine exhaust nozzle. Said thrust control mechanism may further include an absolute reference means to compensate for changes in ambient pressure of the device and a variable nozzle area input means to compensate for changes in combustion engine thrust due to different settings of nozzle area.

3,572,039

BOOSTER ROCKET MOTOR

Albert Ray Osburn, Brigham City, Utah, assignor to the United States of America as represented by the Secretary of the Air Force

Filed Oct. 25, 1968, Ser. No. 773,362
Int. Cl. F02k *9/06*
U.S. Cl. 60—280 2 Claims



An improved booster for a space vehicle or missile and in which the booster employs two types of propellants. The main charge consists of an oxygen-rich mixture cast in the form of a cylinder within the booster and the other charge, which serves as a covering or overlay for the main charge, consists of an oxygen-poor mixture formed as a hollow cylinder. The main charge is therefore rendered immune from combustion by the covering layer so that when oxygen is fed to the interior of the inner cylinder, the oxygen-poor mixture is able to support combustion, and as it burns through its own thickness the main charge becomes uncovered and ignites, due to the presence of the oxygen contained within the main charge. If the booster is one of several, clustered about the space vehicle and fails to ignite upon the introduction of the supplied oxygen, a valve controlled by an explosive bolt in the oxygen supply line is exploded which automatically cuts off the line to all the boosters and terminates the launching operation. In this way, the remaining boosters which might have functioned and therefore could have caused an imbalance of thrust would now have been rendered inactive so that the costly upper stages of the rocket are preserved.

3,572,040

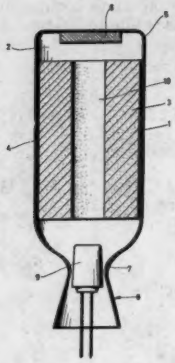
SOLID FUEL GAS GENERATOR

Kuno Dreyer, Munich, Germany, assignor to Messerschmitt-Bolkow Gesellschaft mit beschrankter Haftung, Munich, Germany

Filed Mar. 6, 1969, Ser. No. 804,828
Int. Cl. F02k *9/04*
U.S. Cl. 60—256 1 Claim

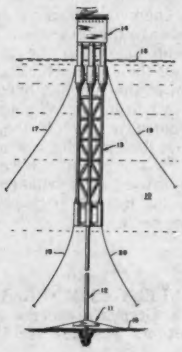
A gas generator, particularly a solid fuel rocket engine, comprises a cylindrical member which is closed at one end and includes thrust nozzle discharge at its opposite end. A solid charge of hollow cylindrical configuration is disposed within the combustion chamber intermediate its length and an igniting charge is located adjacent the closed inner wall of the combustion chamber. The ignition system for the engine includes a detonating cap which is located at the narrow section of the nozzle discharge and it forms a temporary dam to permit the buildup of pressure within the combustion chamber during the initial phase of ignition so that inflammation of the entire length of the interior portion of the cylindrical solid charge can take place. After the detonating cap is ignited, its ignition jet passes through the hollow charge to ignite the igniting charge at the closed end of the combustion chamber. A combustion gas is produced by the igniting

charges flow through the hollow center of the hollow charge and when a sufficient pressure is attained, the burnt out



housing of the detonating cap is ejected through the thrust nozzle.

3,572,041
SPAR-TYPE FLOATING PRODUCTION FACILITY
Gerardus Graaf, the Hague, Netherlands, assignor to Shell Oil Company, New York, N.Y.
Filed Sept. 18, 1968, Ser. No. 760,456
Int. Cl. E02b *17/; E21b 15/02; B63b 35/44*
U.S. Cl. 61—46.5 **8 Claims**

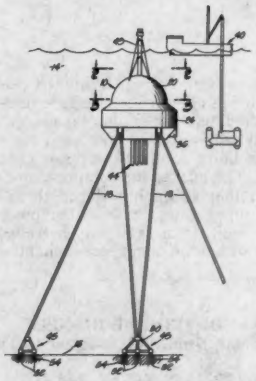


A production facility for underwater oil and gas wells including an onbottom platform to which flow and trunk lines are connected, a marine riser supporting the weight of the vertical portions of the flow and trunk lines, a spar section, and a superstructure which contains all of the fluid handling and processing equipment, controls, personnel requirements etc. When the production system according to the present invention is in assembled condition, the marine riser is vertically disposed on the platform and extends upwardly with the body of water in a substantially self-supporting manner. The spar section and superstructure, after having been separately floated into position over the marine riser, are connected thereto so that a portion of the spar section and all of the super structure component are disposed abode the surface of the water.

3,572,042
PROCESS FOR FORMING A PLASTIC FILL SHEET ON OCEAN FLOOR SILT
Thorndyke Roe, Jr., Oxnard, Calif., assignor to the United States of America as represented by the Secretary of the Navy
Filed Oct. 6, 1969, Ser. No. 864,222
Int. Cl. E02b *3/12, 29/06*
U.S. Cl. 61—36 **2 Claims**

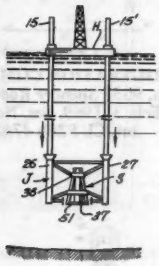
A resin solution is fed through an extrusion head disposed underwater and in close proximity to the sediment of the ocean floor. The solution is formed of a sea water insoluble resin-plasticizer system dissolved in a sea water insoluble solvent, the resin-plasticizer system of the solution having a relatively high specific gravity greater than 1.0 so that, when the system precipitates in the sea water, it drops onto the sediment. Preferably, the extrusion head is moved along at a controlled rate to form a continuous sheet of a desired thickness.

3,572,043
UNDERWATER STRUCTURE
Ernest A. Clara, Los Angeles County, Calif. (GMG Associates 12150 Stagg St. North Hollywood, Calif. 91605)
Filed Feb. 24, 1969, Ser. No. 801,341
Int. Cl. B63b *35/44, 21/00*
U.S. Cl. 61—46 **14 Claims**



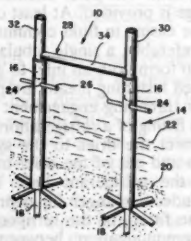
An underwater structure comprising a buoyant housing immersed in a body of water and an anchoring system connected between the housing and the floor of the body of water and cooperating with the fluid pressure of the water to maintain the housing in a stable position a predetermined distance above the floor. The housing is an inverted, generally cup-shaped structure having an open bottom portion, and the anchoring system comprises a plurality of tiedown legs having their upper ends attached to the housing and their lower ends anchored to the floor of the body of water in which the housing is immersed. The tiedown legs are preferably hollow tubular members sealed to prevent water from entering the interior thereof, and of such dimensions as to be relatively weightless in water and of neither negative nor positive buoyancy. The lower ends of the tiedown legs are anchored to the floor of the body of water in which the housing is immersed by means of rods which extend into cavities in the floor and are bonded thereto by grout. An exemplary use of the underwater structure of this invention, an aquadome, is for housing drilling equipment and/or personnel for recovery of petroleum and natural gas from offshore oil fields.

3,572,044
MULTIUNIT OFFSHORE PLATFORM
Ivo C. Pogonowski, Houston, Tex., assignor to Texaco Inc., New York, N.Y.
Filed Mar. 24, 1969, Ser. No. 809,820
Int. Cl. E02b 17/02; E21b 7/12
U.S. Cl. 61—46.5 6 Claims



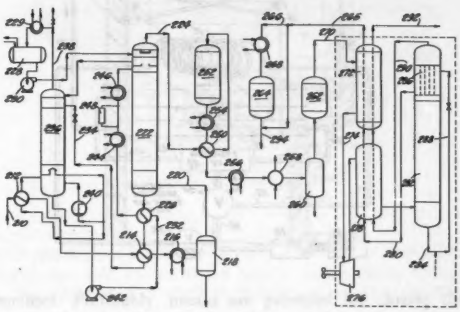
The invention relates to an offshore platform for use in relatively deep water, being equipped for exploratory purposes and/or for producing crude oil from a subsurface wellhead. The platform comprises a floatable hull section that detachably engages an intermediary jacket. The latter supportedly rests on or near the floor of a body of water and incorporates a removable wellhead structure. After use of the platform for drilling and completion operations at a well site, the jacket and wellhead structure are separated whereby the latter will remain at the site, while the jacket is removed by the hull for further use. The jacket is then raised from the ocean floor by the floatable hull for transfer to another well site.

3,572,045
PIER ASSEMBLY
Clifford L. Owen, Hines, Minn.
Filed Oct. 15, 1968, Ser. No. 767,716
Int. Cl. E02b 3/22
U.S. Cl. 61—48 7 Claims



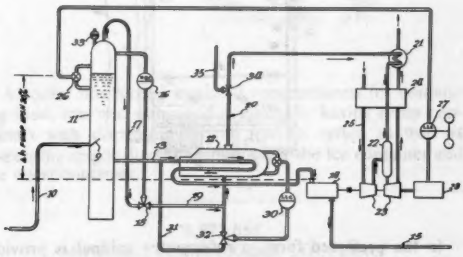
A pier assembly includes pairs of tubular pier supporting posts. The lower ends of the posts are slit to form feet which are bent to extend laterally outwardly and which are provided with a slight twist so that the posts may be screwed securely into the ground, H-shaped pier deck supporting members have vertical legs telescopingly received in the tubular posts and crossmembers for supporting the pier deck. Angle brackets for supporting pier joists or stringers may also be provided on the vertical legs adjacent the crossmember. A tire casing is mounted on the posts and vertical legs to serve as a boat bumper.

3,572,046
APPARATUS FOR PURIFICATION OF RAW AMMONIA SYNTHESIS GAS
Bernard J. Grotz, Jr., Arcadia, Calif., assignor to C. F. Braun & Company, Alhambra, Calif.
Original application Oct. 22, 1965, Ser. No. 502,260, now Patent No. 3,442,613. Divided and this application Sept. 12, 1968, Ser. No. 798,214
Int. Cl. F25j 3/00, 3/08, 3/02
U.S. Cl. 62—38 6 Claims



The present invention relates to apparatus for the purification of raw ammonia synthesis gas which comprises methanating means having an inlet and an outlet, means connecting the outlet of said methanating means with the inlet of first heat exchange means, first heat exchange means having an inlet and an outlet, means connecting the outlet of said first heat exchange means with a work removal means, work removal means, means connecting said work removal means with the inlet of a second heat exchange means, a second heat exchange means having an inlet and an outlet, means connecting the outlet of said second heat exchange means to the inlet of a rectifier means, a rectifier means having an inlet, an outlet and a condenser means, and means for communicating fluid from the lower end of said rectifier means to said condenser means.

3,572,047
ANTICAVITATION AND REFRIGERATION SYSTEM AND METHOD
Paul E. Hatfield, Omaha, Nebr., assignor to Northern Natural Gas Company, Omaha, Nebr.
Filed Mar. 6, 1969, Ser. No. 804,921
Int. Cl. F17c 7/02; F17d 1/14
U.S. Cl. 62—45 14 Claims

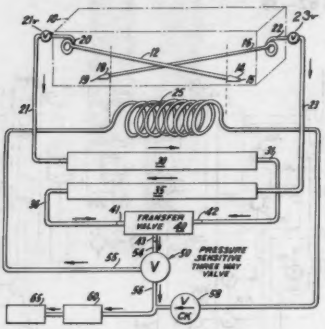


In a cryogen-pumping system, the formation of vapor due to heat leak, especially, causes cavitation in the pump. A separator is provided to separate the cryogen vapor from the liquid. Then the vapor is expanded in a heat exchanger to subcool the cryogen liquid upstream of the pump.

3,572,048
OMINPOSITIONAL CRYOGENIC UNDERWATER BREATHIND APPARATUS

Robert H. Murphy, West Hartford, Conn., assignor to The Wiremold Company, West Hartford, Conn.

Filed Oct. 14, 1968, Ser. No. 767,373
Int. Cl. F17c 7/02
U.S. Cl. 62—52 19 Claims

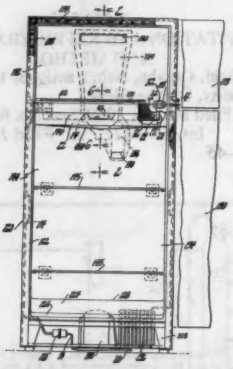


Cryogenic underwater breathing apparatus comprises a liquified air storing tank having mounted therein freely pivoted pickup tubes for extracting the stored fluid. An orientation responsive transfer valve automatically connects at least one of the pickup tubes, having a weighted receiving orifice disposed within the liquid phase air mass under the action of gravity, to an output demand regulator for consumption via air vaporizing apparatus, with structure being provided to maintain the system in a proper pressurized relationship relative to the ambient environment.

3,572,049
ELECTRICAL ASSEMBLY FOR A REFRIGERATOR

Earl J. Moorman, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 22, 1969, Ser. No. 859,781
Int. Cl. F25b 49/00
U.S. Cl. 62—132 5 Claims

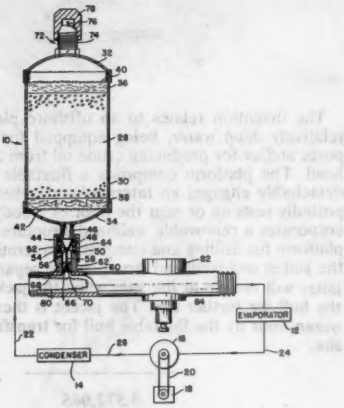


In the preferred form, a refrigerator cabinet is provided with a sheet metal outer shell and a plastic inner liner with polyurethane foam insulation in between. The interior of the inner liner is divided into an upper freezing compartment and a lower above freezing compartment by a sheet metal wall having a lower portion in the rear and a higher portion in the front supported by a front crossmember and the rear wall of the outer shell. Suitable insulation and an evaporator are provided above the lower portion together with a fan and fan motor at the rear which draw air through the inlets in the sheet metal wall and at the front of the upper compartment through the evaporator and discharge the air through plastic ducts in the rear wall extending to both the upper and lower compartments. A lamp socket and lamp, and a removable plastic housing surrounding the lamp are supported directly by the higher front portion of the sheet metal wall. This housing supports a centrally located door switch cooperating with the door to the lower compartment and connected in series with the lamp socket. A thermostatic refrigeration control switch is also mounted upon the housing and has a thermosensitive bulb extending to the lower rear portion of the sheet metal wall.

3,572,050
REFRIGERATION COMPONENT

Edward W. Bottum, 9357 Spencer Road, Brighton, Mich.

Filed Feb. 3, 1969, Ser. No. 795,827
Int. Cl. F25b 47/00
U.S. Cl. 62—85 17 Claims



The refrigeration component comprises a drier for a refrigeration system. The drier encloses a casing in which a desiccant charge is provided. At least one tubular member is provided on the casing in fluid communication with the casing interior. Preferably, a single tubular member is provided on the casing to form both an inlet to and an outlet from the casing. Threaded fastening means are provided on that tubular member for threading engagement with threaded fastening means on a fitting of a refrigeration line of a refrigeration system to connect the drier to the system for the flow of refrigerant into and out of the drier in response to pressure conditions in the refrigerant line. The tubular member preferably includes a plunger for depression of a valve element within the fitting of the refrigerant line to simultaneously open communication between the drier and the refrigerant line upon screwing of the drier onto the fitting.

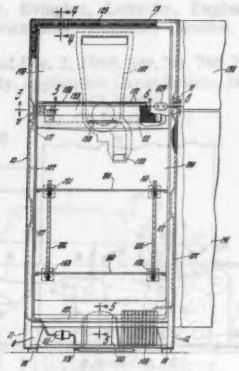
3,572,051
PARTIAL INTERNAL CONDENSER

Louis D. Benasutti, Fairborn, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 22, 1969, Ser. No. 859,780
Int. Cl. F25b 47/00
U.S. Cl. 62—277 6 Claims

In the preferred form of this sheet metal refrigerator cabinet, an inturned front flange extending at right angles to the top and sidewalls has an inturned U-shaped stiffening fold which snugly receives a loop of refrigerant tubing located in the refrigerant circuit between the condenser and the evaporator. This construction not only stiffens the front door

opening of the cabinet but also provides efficient heat transfer from the warm refrigerant tubing to the U-shaped



fold to prevent condensation of atmospheric moisture around the door opening.

3,572,052

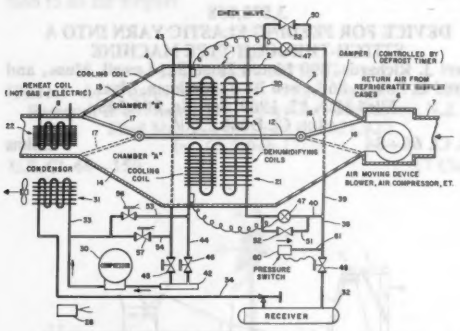
DUCTED REFRIGERATION UNIT

Steven J. Toth, Kendallville, Ind., assignor to Streater Industries Inc., Albert Lea, Minn.

Filed May 15, 1969, Ser. No. 824,934

Int. Cl. F25b *47/00*

U.S. Cl. 62—278 **3 Claims**



The invention relates to a ducted refrigeration unit for continuously supplying quantities of refrigerated air to a group of refrigerated food display cases. The unit has two chambers arranged in parallel with a cooling coil disposed in each chamber. A liquid refrigerant is selectively and alternately supplied to one coil during the time a hot defrosting gas is supplied to the other coil. Damper means alternately direct circulating air through the chamber in which the coil thereof is supplied with a liquid refrigerant while bypassing the chamber in which the coil thereof is being defrosted.

3,572,053

HOUSEHOLD REFRIGERATOR INCLUDING THROUGH-THE-DOOR ICE SERVICE

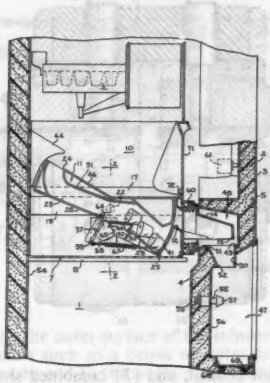
Dwight W. Jacobus, and William C. Bodong, Louisville, Ky., assignors to General Electric Company

Continuation-in-part of application Ser. No. 824,728, Apr. 29, 1969, now abandoned , which is a continuation of application Ser. No. 669,234, Sept. 20, 1967, now abandoned. This application June 23, 1969, Ser. No. 835,689

Int. Cl. F25c *5/18*

U.S. Cl. 62—344 **17 Claims**

A refrigerator cabinet including a freezer compartment containing an icemaker, an ice storage receptacle and dispenser for storing and dispensing ice pieces made by the ice maker, a passage in the freezer door for delivering ice pieces from the dispenser to a service area on the outer surface of the door, and operating means including an actuating means on the outer surface of the door for energizing the



dispenser. Preferably, means are provided for closing the passage when the dispenser is not energized and the receptacle and dispenser are removable as a unit from the cabinet. A door-operated switch prevents operation of the dispenser when the door is open.

3,572,054

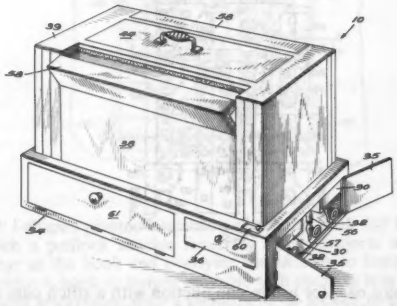
PORTABLE COOLER

Anthony M. Curcio, 3723 N. 8th St., Philadelphia, Pa.

Filed Feb. 25, 1969, Ser. No. 802,000

Int. Cl. B67d *5/62*

U.S. Cl. 62—390 **5 Claims**



A cooler box having insulated compartments for containing food, ice, and water and additionally having syrup containers with dispensing spigots for the syrup, as well as dispensing spigots for the melted ice of the ice container and the water container.

3,572,055

MARINE-TYPE FLEXIBLE COUPLING

Peter R. Billey, 17 Stillman St., South Dartmouth, Mass.

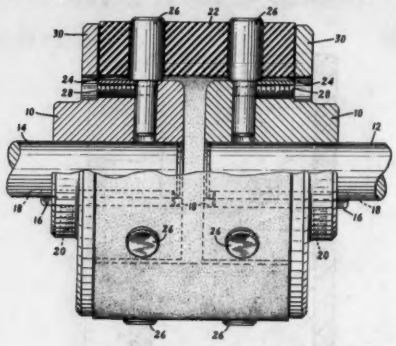
Filed Aug. 13, 1969, Ser. No. 849,845

Int. Cl. F16d *3/52*

U.S. Cl. 64—11 **4 Claims**

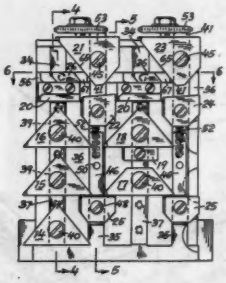
A marine-type flexible coupling comprising hubs attached to the drive shaft and the propeller shaft connected by a loose-fitting elastomeric sleeve held on the hubs by pins passing through the sleeve into the hubs which is capable of

handling (1) angular misalignment which occurs when the connected shafts are not parallel or not coaxial; (2) parallel offset alignment which occurs when the connected shafts are



parallel but not coaxial; and (3) combined shaft offset and angular misalignment which occurs when the connected shafts are not parallel and their centerlines do not intersect.

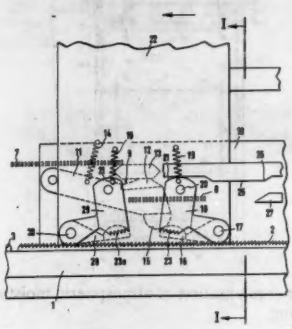
3,572,056
GUARD CAM FOR KNITTING MACHINES
Jack Radin, Brooklyn, N.Y., assignor to Monarch International Ltd., Brooklyn, N.J.
Continuation of application Ser. No. 830,186, May 16, 1969, now abandoned , which is a continuation of application Ser. No. 665,929, Sept. 6, 1967, now abandoned. This application Dec. 15, 1969, Ser. No. 885,369
Int. Cl. D04b *9/26*
U.S. Cl. 66—57 **11 Claims**



A guard cam for use in conjunction with a stitch cam at a feed in latch needle-knitting machines, which, with the stitch cam, provides therebetween a confined path of travel for the needless in their stitch-drawing movement and which, by itself, prevents undesirable needle overthrow and provides proper paths of travel for needles moving at the tuck and welt levels. The guard cam is adjustable in a direction at right angles to the direction of adjustment of the stitch cam whereby a fixed distance may be maintained therebetween.

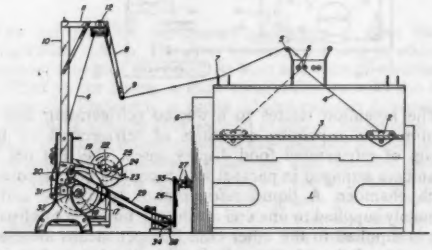
3,572,057
ARRESTING MECHANISM FOR A CARRIER MOUNTED ON A CARRIAGE OF A FLAT KNITTING MACHINE
Erich Krause, Bopfingen, Germany, assignor to Universal Maschinenfabrik Dr. Rudolf Schieber G.m.b.H., Westhausen, Germany
Filed Sept. 10, 1969, Ser. No. 856,858
Int. Cl. D04b *7/10*
U.S. Cl. 66—76 **6 Claims**

A carrier for the narrowing device of a flat knitting machine moves from a leading position to a trailing position on a carriage when the carrier is arrested while the carriage moves along a needle bed, and a cam arrangement on the carrier and carriage operates the narrowing during the carrier arrest. The arresting mechanism is triggered by a jack butt



in the needle bed which tilts an actuating arm on the carriage by abutting engagement, the actuating arm pivoting a toothed stopping arm on the carrier into engagement with a toothed arresting rail on the needle bed.

3,572,058
DEVICE FOR FEEDING ELASTIC YARN INTO A STITCH-THROUGH TYPE MACHINE
Albert J. Richards, 290 Mount Hope St., Lowell, Mass., and Fred E. Bower, 86 Lowell Blvd., Methuen, Mass.
Filed Mar. 12, 1969, Ser. No. 806,545
Int. Cl. D04b *23/06*
U.S. Cl. 66—84 **7 Claims**

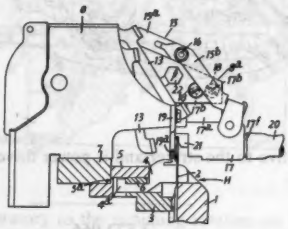


A device, which can be in the form of an attachment to a stitch-through fabric-making machine, such as a Malimo machine. The attachment is particularly useful for laying in elastic weft threads to be stitched in by warp threads into the fabric and takes a drive from the main machine drive to turn a drum or drums which receive weft or filling threads, such as elastic threads, from a beam or creels they drive. The rotation of the drum, while continuously in one direction, is at varying rates so that the elastic filling threads are fed to the machine carriage at the rate the carriage moves, which prevents stretching of the filling threads and produces a smooth, uniform fabric. The device can be in the form of an attachment to an already existing machine or, of course, can be built into a new machine.

3,572,059
IMPROVED MULTIFEED CIRCULAR KNITTING MACHINE EQUIPPED WITH PNEUMATIC YARN TRAPPERS

Walter Goadby, Evington, Leicester, England, assignor to Camber International (England) Limited, Leicester, England

Filed Dec. 2, 1968, Ser. No. 780,377
Claims priority, application Great Britain, Dec. 16, 1967, 57,235/67
Int. Cl. D04b *15/61*
U.S. Cl. 66—140 **8 Claims**



A multifeed circular knitting machine with a striper at each feed. Each striper includes fingers to present yarns and withdraw them from needles, and a cutter device for severing a withdrawn yarn. A yarn holder block, between each striper and its cutter device, holds a withdrawn and severed yarn until next required. Each yarn holder block has a through-aperture open at one end adjacent to a path taken by a withdrawn yarn and in communication at its opposite end with air suction. Air suction is produced by a fan unit common to all the stripers.

3,572,060
MACHINE KNITTING

Charles A. Titone, Burlington, N.J., assignor to Titone Research & Development Corporation, Burlington, N.J.

Filed May 5, 1969, Ser. No. 821,922
Int. Cl. D04b *27/34*
U.S. Cl. 66—150 **17 Claims**

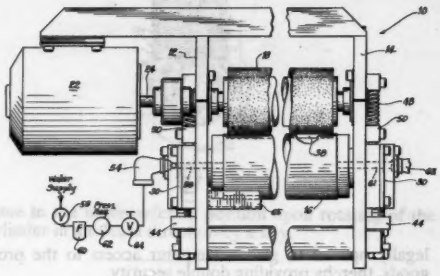
Lateral contraction or "necking" of warp-knitted tubular fabric between knitting and winding locations is prevented by inserted guide plates equal in width to the as-knit tubular portions and supported for lateral movement, as is especially useful in manufacture of panty hose and similar bifurcated tubular garment fabrics or the like.

3,572,061
MOISTURIZER MEANS FOR WEBS

Henry H. Hering, Jr., Homewood, Ill., assignor to B. Offen & Co., Inc., Chicago, Ill.

Filed Jan. 2, 1969, Ser. No. 788,502
Int. Cl. B05c *5/00*
U.S. Cl. 68—200 **7 Claims**

An apparatus for applying moisture to web surfaces wherein water or other fluid is introduced into tubular supply means located adjacent the path of movement of the web. An opening is provided in the top surface of the tubular elements and the water is maintained under pressure so that a continuous supply of water is forced outwardly through the opening

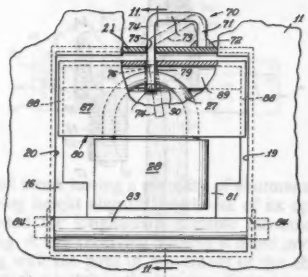


and exposed on the outer surface of the tubular elements. An applicator means such as a brush operates to continuously pick up the water and to throw the water onto the web surfaces.

3,572,062
TAMPER PROOF LOCKING MEANS USING A PADLOCK

Emmett R. Beebe, Glenview, Ill., assignor to S & C Electric Company, Chicago, Ill.

Filed Sept. 22, 1969, Ser. No. 859,975
Int. Cl. E05b *15/02, 65/52;* **E05c** *3/04*
U.S. Cl. 70—1.5 **7 Claims**



A J-shaped pivoted hasp has a slot in the hook end through which a padlock shackle receiving staple projects with the flange at the hook end overlying the shackle to limit access thereto. A hook or tongue movable with the hasp is in several species engageable with a member to be locked to the hasp carrying member. Also in another species the staple is mounted on one member and the hasp is pivoted on another member. The staple is movable into locking engagement with the hasp when the padlock is forcibly displaced.

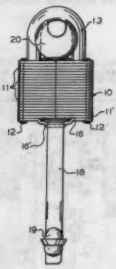
3,572,063
TAMPER-PROOF SEAL RETAINING LOCKS

Daniel J. Foote, Wauwatosa, Wis., assignor to Master Lock Company, Milwaukee, Wis.

Filed Sept. 8, 1969, Ser. No. 855,818
Int. Cl. E05b *67/38;, 171/4, 39/02*
U.S. Cl. 70—50 **4 Claims**

For goods or materials which are shipped or stored under seal there is provided a key-actuated lock formed on one wall with a channel plate having an opening therein registering with the keyway of the lock. The channel plate is adapted to hold over the lock keyway and in guarding relation thereto, a portion of a sealing element. As long as the sealing element remains intact and in position it is impossible for a tamperer to gain unauthorized access to the lock keyway. However, if

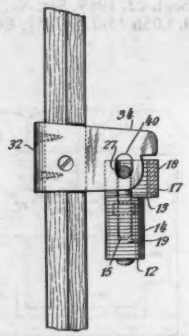
the seal should be removed or broken, thus giving visual evidence of tampering, the lock must, nevertheless, be illegally opened to give a tamperer access to the protected goods, thereby providing double security.



3,572,064
PADLOCKS

Daniel Victor Berry, Bracknell, and Stanley Gerald Thomas Knott, Wadhurst, England, assignors to Ingersoll Locks Limited, London, England

Filed Jan. 27, 1969, Ser. No. 794,250
Int. Cl. E05b *67/22;* **E05c** *19/08*
U.S. Cl. 70—52 **4 Claims**



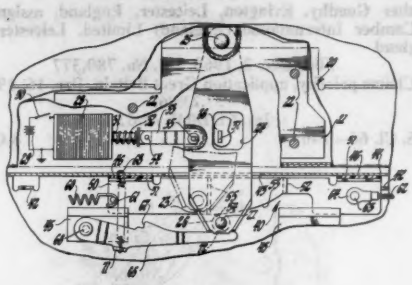
The invention relates to a padlock comprising a shackle adapted to engage with one or more members to be locked, a casing adapted to accommodate said shackle in a locking position and provided with a recess adapted to accommodate part of said member or members when the shackle is in said locking position the arrangement being such that in use with the shackle in the locking position at least part of the member-engaging portion and the member or members adapted to be engaged thereby is accommodated by said recess.

3,572,065
CLOSURE LATCH

Theodore F. Peters, Utica, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed July 31, 1969, Ser. No. 846,537
Int. Cl. E05b *65/19;* **E05c** *3/30, 11/00*
U.S. Cl. 70—156 **10 Claims**

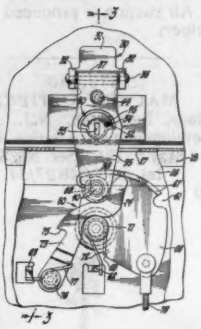
A closure latch for a vehicle body deck lid or the like includes a striker pivotally mounted on the deck lid for movement from a first position in operative relation to a latch member slideably mounted to the vehicle body to a second position out of engagement with the wedge plate, movement of the striker to the second position to unlatch the deck lid being effected by a power source from within the vehicle or by a conventional key lock from the exterior of the vehicle. The latch member is slideably mounted on the vehicle body for movement from an unlatched position to a latched position relative to the striker and is power driven to the latched position.



3,572,066
CLOSURE LATCH

Theodore F. Peters, Utica, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed July 31, 1969, Ser. No. 846,450
Int. Cl. E05b *65/19;* **E05c** *3/30, 11/00*
U.S. Cl. 70—156 **6 Claims**



A closure latch for a vehicle deck lid or the like includes a striker plate pivotally mounted on the deck lid for movement from a first position in operative relation to a latch member to a second position out of engagement with the latch member. The latch member, in the form of a wedge plate is pivotally connected to the vehicle body and power rotated during final closure to engage and pull down the striker plate thereby pulling the deck lid firmly against the vehicle body with a weather seal compressed therebetween.

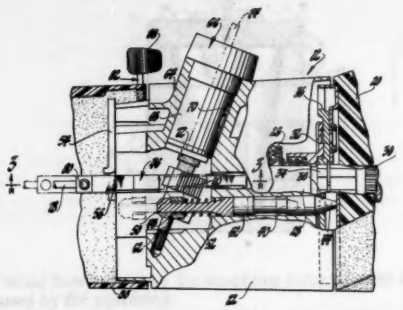
3,572,067
STEERING COLUMN LOCK

Dan R. Kimberlin, and Frederick C. Riffelmacher, Saginaw, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 1, 1969, Ser. No. 846,881
Int. Cl. B60r *25/02;* **E05b** *65/12*
U.S. Cl. 70—252 **4 Claims**

A motor vehicle-steering column lock of the type having a lock bolt movable between locking and unlocking positions with relation to the vehicle-steering shaft and an ignition and starter switch assembly both controlled by a key-operated rotatable cylinder lock further includes a finger-operated blocking lever operative to prevent key rotation of the

cylinder lock actuator to a position placing the lock in locked condition until the blocking lever is first consciously

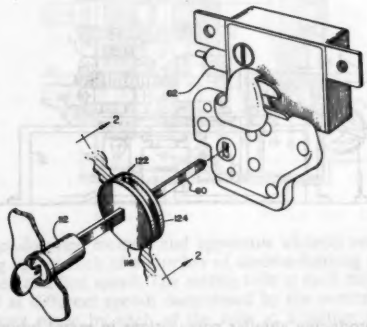


depressed preparatory to the actuating rotation on the lock cylinder actuator.

3,572,068
LATCH RELEASE SYSTEM

Peter T. Carlson, Canton; Frederick J. Weremey, Milton, and Edward B. Mitchell, Belmont, Mass., assignors to United-Carr Incorporated, Boston, Mass.

Filed Sept. 12, 1968, Ser. No. 759,286
Int. Cl. E05b *65/12*
U.S. Cl. 70—241 **6 Claims**



This is a latch release system which uses a manually actuated switch means electrically connected to a release mechanism including a heat motor and gear means. The heat motor and gear means have means of electrically opening the circuit instituted by the manual switch. The gear means turns a shaft which is connected at one end to a keylock and which is passed through a latch mechanism and is adapted to turn in one direction without turning the keylock.

3,572,069
KEY OR PERMUTATION OPERATED LOCK

George P. Junkunc, Palos Heights, Ill., assignor to Junkunc Bros. American Lock Company, Crete, Ill.

Filed Sept. 18, 1969, Ser. No. 859,072
Int. Cl. E05b *37/08, 65/02*
U.S. Cl. 70—285 **10 Claims**

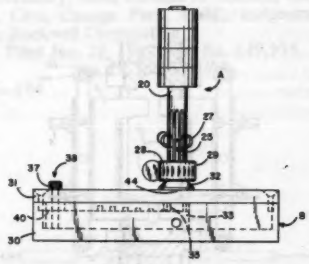
Combined key or permutation operated lock for locker doors and the like wherein a set of tumblers is mounted on a fixed center post for axial movement therealong between a normal position wherein a fence on a pivoted latch bolt confronts peripheral edges of the tumblers and noninterfering position wherein the set of tumblers is clear of the fence to permit release of the latch bolt. Cam means operated by a key cylinder engage the set of tumblers and selectively move

the same to the noninterfering position upon rotating of the key cylinder in a release direction by a key.

3,572,070
SETTABLE KEY AND SETTING MECHANISM FOR TUBULAR LOCK

Max K. Brand, P.O. Box 3531, San Diego, Calif.

Filed May 22, 1969, Ser. No. 826,904
Int. Cl. E05b *19/18*
U.S. Cl. 70—411 **8 Claims**



An elongated block having a plurality of abutments of successively varying height aligned lengthwise of its upper surface, is mounted for longitudinal slidable movement in a boxlike housing. A key-receiving bushing is fitted into the top of the housing with the path of movement of the abutments extending through a notch in the bushing. Detent means centers any selected one of the abutments in the notch in the bushing bore. A settable key for a tubular lock comprises a tubular body insertable in the bushing and having a plurality of tumbler-actuating pins mounted for independent longitudinal adjustment in individual grooves located symmetrically about the periphery of the body. The pins are enclosed by an encircling resilient sleeve enclosed by a compressible steel band. With the key inserted in the bushing and bearing on the block, the pins are adjusted in predetermined sequence to contact code-determined ones of the abutments and are retained in adjusted or set position by the resilient pressure of the band enclosed sleeve.

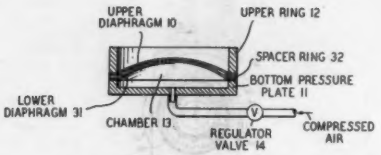
3,572,071
PARABOLIC REFLECTOR ANTENNAS

Ralph A. Semplak, Shrewsbury, and Richard H. Turrin, Colts Neck, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed June 7, 1968, Ser. No. 735,334
Int. Cl. B21d *26/02*
U.S. Cl. 72—54 **1 Claim**

This application discloses a method for making a paraboloidal surface. In particular, such a surface is made by immobilizing the circumference of a circular portion of a thin diaphragm and applying a sufficient uniform pressure to the circular portion to permanently deform it. It has been discovered empirically that the surface thus produced is

paraboloidal to a sufficiently high degree of approximation to be useful as a microwave reflector antenna. In addition,



refinements in the final shape can be realized by using a plurality of closely spaced blanks in the deformation process.

3,572,072

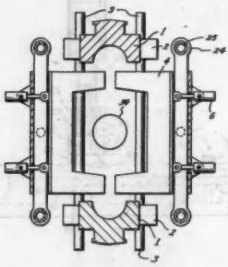
ELECTROHYDRAULIC-FORMING SYSTEM

Marvin L. Hundley; Edwin A. Till, Jr., and Buel O. Russell, Fort Worth, Tex., assignors to said Hundley and said Russell assignors to Electro-Form, Inc., Fort Worth, Tex.

Continuation-in-part of application Ser. No. 656,142, July 26, 1967, now abandoned. This application Feb. 8, 1968, Ser. No. 709,523

Int. Cl. B21d *26/12*

U.S. Cl. 72—56 **22 Claims**



Electroforming system including a tubular forming apparatus and a switch means for connecting an electrical power source to any one of a plurality of such forming apparatus. The forming apparatus includes two die portions which are wedgedly engaged by die support means to maintain the die portions in a closed position during the electroforming operation. End covers having novel seal means and electrodes are provided to enclose a workpiece within the die assembly. The switch means includes a first pair of conductive plates which is connected by coaxial cables to the power supply. A pair of plates is also provided for each forming apparatus and is connected by coaxial cables to the electrodes of the forming apparatus. The latter plates are movably mounted to abut the first pair of plates. A shorting bar is provided which abuts the first pair of plates when no plates are in an abutting position with the first two pairs.

3,572,073

METHOD OF SHAPING A THIN-WALLED BODY

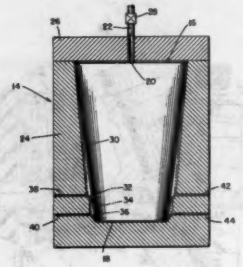
Walter B. Dean, Narberth, and Harry P. Schane, Both (c/o The Budd Company 250 Huntng Park Ave. Philadelphia, Pa. 19132), Lafayette Hill, Pa.

Filed Mar. 10, 1969, Ser. No. 805,403

Int. Cl. B21d *26/04*

U.S. Cl. 72—62 **4 Claims**

A method of shaping a body includes putting a preform into a mold and heating the assembly to produce and increase pressure within the preform causing the preform to expand and conform to the shape of the interior of the mold.



3,572,074

CORRUGATING METHODS AND APPARATUS

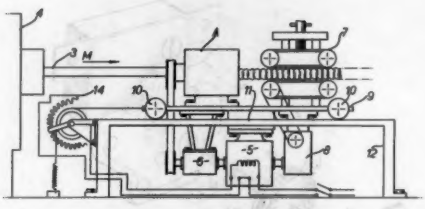
Henry William Holdup, Southampton; John Alfred Baskwell, Winchester; Reginald Henry Lush, Midanbury, Southampton, and James Arthur Francis Donelan, Alton, England, assignors to Pirelli General Cable Works Limited

Filed Jan. 3, 1969, Ser. No. 788,779

Claims priority, application Great Britain, Jan. 9, 1968, July 25, 1968, 1266/68;35552/68

Int. Cl. B21d *15/04*

U.S. Cl. 72—77 **4 Claims**



For producing annular corrugations in metal tubing, such as an electric cable sheath, an apparatus is disclosed which includes an annular corrugating member having a helical-working ridge on its inner circumference and mounted so as to encircle the tubing eccentrically with the working ridge bearing against the tubing. The corrugating member is mounted for free rotation in its own plane within a head which is itself rotatable about the tubing axis so as to move the geometric center of the corrugating member in a circle around the tubing axis. The working ridge bears against successive portions of the tubing to form annular corrugations as the head is rotated and the tubing is moved through the corrugating member.

3,572,075

METAL-ROLLING METHODS

Claus L. Sporck, Traverse City, Mich., assignor to Hitco, Gardena, Calif.

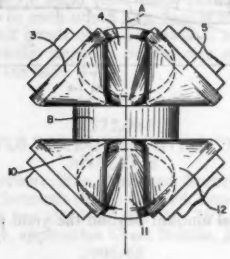
Filed Nov. 13, 1968, Ser. No. 775,266

Int. Cl. B21h *1/02*; B21b *19/14*

U.S. Cl. 72—86 **9 Claims**

The method of forming metal billets into desired cylindrical and circular shapes by imposing a squeezing force on the billet to cause the metal to flow in a direction for obtaining

the desired shape while simultaneously imposing an additional force operating in a direction the same as the direction



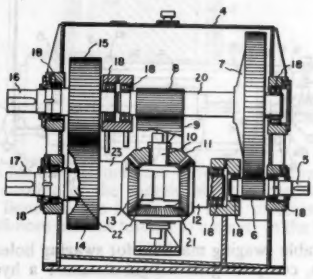
of metal flow caused by the squeezing force to assist the flow caused by the squeezing.

3,572,076

PIPE-FORMING METHOD AND APPARATUS

Shigeo Kojima; Tsutomu Nishi; Tetsunosuke Ogo, and Tetsuo Sasaki, Kawasaki-shi, Japan, assignors to Nippon Kokan Kabushiki Kaishi, Japan

Filed Oct. 14, 1968, Ser. No. 767,208
Claims priority, application Japan, Oct. 14, 1967, 65893/67
Int. Cl. B21d *5/08*
U.S. Cl. 72—181 **7 Claims**



A pipe-forming method and apparatus wherein one pipe-forming roll at each of a number of tandem-forming stations is rotated at a first speed. The mating rolls at each station are rotated at different speeds determined by the central points of contact made by each of the rolls at a station and the metal plate being formed, thereby minimizing the effects of slippage between the other surfaces of the rolls and the metal plate and preventing the breakage of the drive shafts for the rolls.

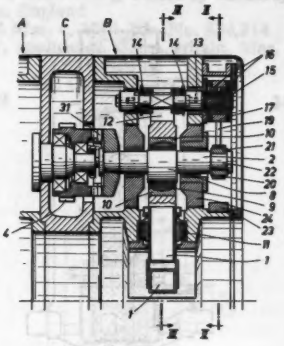
3,572,077

APPARATUS FOR A CONTINUOUS SWAGING OF ROD-SHAPED WORKPIECES

Bruno Kralowetz, Weinleiten 142, Steyr, St. Ulrich, and Gottfried Blaimschein, Punchstrasse 2, Steyr, Austria

Filed Apr. 18, 1969, Ser. No. 817,356
Claims priority, application Austria, May 3, 1968, A4253/68
Int. Cl. B21j *9/06, 9/18*
U.S. Cl. 72—189 **10 Claims**

At least one swaging unit is provided, which defines a feed path along which a rod-shaped workpiece is axially movable in said unit. Each of said units comprises a frame, a plurality of guides spaced around said path and extending substantially radially with respect to said path and rotatably mounted in said frame on axes which extend transversely to said path, a plurality of dies which consist of connecting rods and are slidably mounted in respective ones of said guides, a plurality of eccentric shafts mounted in said frame and extending parallel to said path and operatively connected to respective ones of said dies to reciprocate the same in said guides, and oscillating means for imparting to each of said dies an oscillating pivotal movement about the axis of rotation of the respective guide.

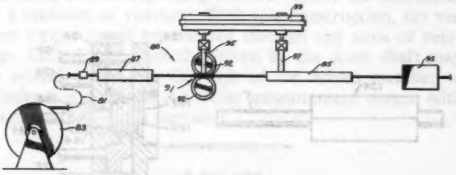


3,572,078

VARIABLE ORIFICE, ZERO FRICTION DRAW DIE

Clifford F. Kennedy, Simi; Thomas M. Shelton, Glendale, and Hugh N. Chu, Canoga Park, Calif., assignors to North American Rockwell Corporation

Filed Jan. 29, 1967, Ser. No. 649,975
Int. Cl. B21b *21/00*
U.S. Cl. 72—194 **10 Claims**



A tube tapering arrangement including at least three rotatable and equiangularly spaced circular disc dies. The die circumferences are identically contoured with variable depth die peripheries that are aligned adjacent one another in a geometric pattern defining a die orifice. During tube tapering of elongated workpieces, the disc dies are rotated synchronously so that the workpiece is deformed to the desired taper configuration.

ERRATUM

For Class 72—199 see:
Patent No. 3,572,146

3,572,079

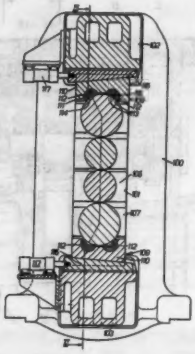
ROLLING MILLS

Harry Laurence Fred Bond, Hathersage, near Sheffield, England, assignor to Davy and United Engineering Company Limited, Sheffield, Yorkshire, England

Filed Aug. 29, 1967, Ser. No. 664,120
Claims priority, application Great Britain, Aug. 31, 1966, 38874/66
Int. Cl. B21b *31/32, 31/30*
U.S. Cl. 72—245 **2 Claims**

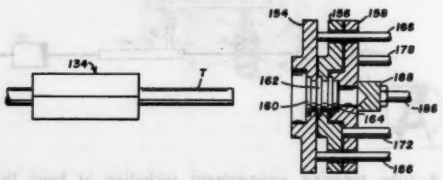
This invention is concerned with improved bearings for rolls of a rolling mill. According to the invention a pair of opposed rolls are supported in vertically adjustable hydrostatic

bearing assemblies for resisting the vertical rolling force and separate means are provided to contain the horizontal forces. The hydrostatic bearing assemblies surround less than half



the circumference of the roll barrels so that they can accommodate different sizes of rolls and do not need to be changed each time the rolls are changed or reground.

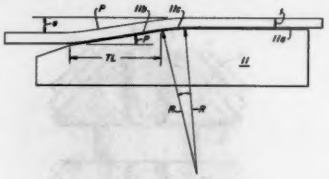
3,572,080
PRODUCTION OF POINTED WORKPIECES
Peter Alexoff, Poland; George A. Mitchell, Youngstown, Ohio, and Fred E. Halstead, Wynne, Ark., assignors to George A. Mitchell Company, Youngstown, Ohio
Continuation-in-part of application Ser. No. 681,291, Nov. 7, 1967, now abandoned. This application Oct. 3, 1968, Ser. No. 764,875
Int. Cl. B21c *5/00*
U.S. Cl. 72—354 6 Claims



Described are a method an apparatus for pointing long slender workpieces, characterized in that concentric, telescoping dies of successively smaller cross-sectional areas are forced over the end of the workpiece to thereby progressively reduce its cross-sectional area in steps. Also described are a method and apparatus for preventing bowing or curving in a point formed by forcing a die over a workpiece to extrude the point.

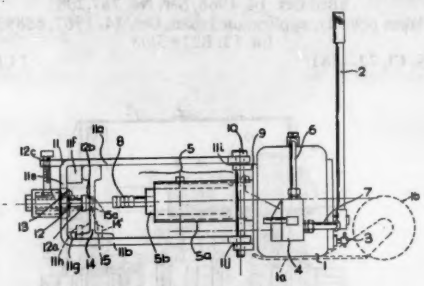
3,572,081
APPARATUS FOR MECHANICALLY EXPANDING LARGE DIAMETER PIPE
Douglas E. Alexander, North Huntington Township, Westmoreland County, Pa., assignor to United States Steel Corporation
Filed Apr. 21, 1969, Ser. No. 818,036
Int. Cl. B21d *41/02*
U.S. Cl. 72—393 3 Claims

Apparatus for expanding pipe in increments includes a plurality of expandable dies having a length substantially less than that of the pipe. Each die includes a first curved outer section with a radius substantially equal to the inside diameter of the expanded pipe, a second curved outer tapered section having a minimum radius no greater than the inside radius of the unexpanded pipe, and a third arcuate section tangent to the first and second sections. The third section is also arcuate in its longitudinal direction and has a radius sufficiently long to prevent stressing of the fibers of the pipe



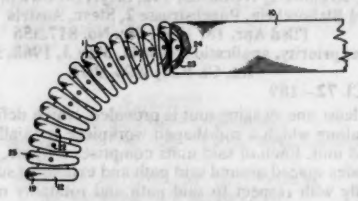
wall a substantial amount beyond the yield point of the pipe material.

3,572,082
RAIL HOLE SWAGING MACHINE
William Wooley Payne, Nottinghamshire, England, assignor to W. E. & F. Dobson Limited
Filed Dec. 5, 1967, Ser. No. 688,159
Claims priority, application Great Britain, Dec. 13, 1966, 55824/66
Int. Cl. B21j *9/12*
U.S. Cl. 72—453 7 Claims



A portable swaging machine for swaging holes in laid railway rails, comprising as a rigid structure a hydraulic hand pump to which is connected a control and a hydraulic jack, the jack ram having its outer end adapted for fitment of a swaging tool, a releasable fastening device in the form of a U-frame releasably pivoted to the rigid structure and adapted for fitting about a rail in looplike manner, there being optionally provided a centering plunger for engaging the rear of the hole, a spacer for use with a bull head rail, adjustment means for holes at different levels, and skid or wheel means under the machine.

3,572,083
ARTICULATED FLEXIBLE WAVE GUIDE BENDING AND SIZING MANDREL FOR H PLANE
John G. Schmitt, 2516 Norcross St., Hillcrest Heights, Md.
Filed Aug. 19, 1968, Ser. No. 753,350
Int. Cl. B21b *25/04*
U.S. Cl. 72—466 3 Claims



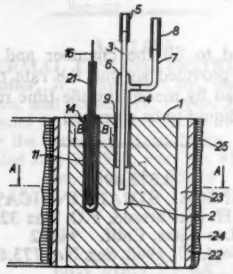
This invention is directed to an articulated flexible waveguide bending and sizing mandrel for the H-plane form.

This mandrel is capable of forming a waveguide inner surface which is free of scratches or burrs and without any flats or sidewall wrinkles in the bend surfaces or along the straight sections. A plurality of individual elements are secured together by separate shear pins which permits the elements to pivot relative to each other. One face is made at an angle in order to permit bends up to 180° with a minimum radius. The minimum radius depends on the size of each element and the angle of the face.

3,572,084
APPARATUS FOR DIFFERENTIAL THERMAL ANALYSIS

Ivor Clifford Herbert May, Banstead Surrey, England, assignor to BP Chemicals (U.K.) Limited, London, England

Filed Jan. 21, 1969, Ser. No. 792,708
Claims priority, application Great Britain, Jan. 25, 1968, 3906/68
Int. Cl. G01n *25/00*
U.S. Cl. 73—15 **6 Claims**



Apparatus for low temperature differential thermal analysis wherein cooling of the sample block is carried out by means of a liquefied gas fed in the form of discrete slugs through small-bore plastics tubing, to a cavity in the block.

3,572,085
METHOD OF DETECTING LEAKS IN FLUID-CONTAINING EQUIPMENT

Joseph J. Packo, 3043 N. Federal Highway, Fort Lauderdale, Fla. 33306

No Drawing. Filed Dec. 18, 1968, Ser. No. 784,898
Int. Cl. G01m *3/22*
U.S. Cl. 73—40.5 **8 Claims**

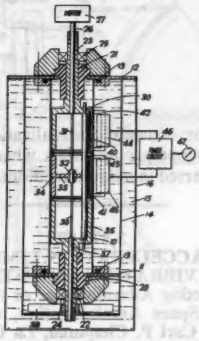
The invention relates to a method of detecting leaks in closed systems, for example pipelines, vessels, containers and other equipment adapted to contain fluids in static or flowing condition. According to the present invention certain agents which provide heat reactions, referred to as heat indicants, are used. A suitable amount of a heat-indicant compound is supplied to the interior of such equipment. In event a leak exists or develops in such equipment the heat-indicant upon escape into the atmosphere will react with oxygen and/or moisture and generate heat. The heat thus generated can be detected by suitable sensitive infrared detector equipment thereby giving an indication that a leak exists.

Examples of heat-indicant agents which are suitable for detecting leaks in closed systems are metal alkyls, metal alkyl halides, metal hydrides, metal alkyl hydrides, diphosphines, alkyl phospines halide, alkyl phosphines. When such agents escape into the air they react with the oxygen and/or moisture and generate heat which can be detected by suitable infrared detector equipment.

3,572,086
VISCOMETERS

James Stewart Johnston, Bognor Regis, England, assignor to Rosemount Engineering Company Limited, Bognor Regis, Sussex, England

Filed Mar. 4, 1969, Ser. No. 804,214
Claims priority, application Great Britain, Mar. 7, 1968, 11,143/68
Int. Cl. G01n *11/14*
U.S. Cl. 73—59 **24 Claims**

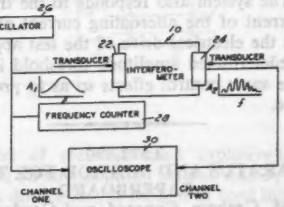


A viscometer has a cylindrical driven member immersed in the liquid within a cylindrical container. A continuously rotated drive shaft extends into the container and is coupled by a resilient coupling to the driven member so that the viscous drag due to fluid in the annular gap between the driven member and container causes the driven member to lag behind the drive shaft; the lag is sensed as a time lag, using sensors outside the container, as a measure of viscosity. With this construction, the viscous torque is not transmitted through any seals or bearings. Guard rings directly driven by the drive shaft may be provided adjacent the ends of the driven member to eliminate end effects. A vernier measurement system with electrical read-out is provided.

3,572,087
PHASE ANGLE MEASUREMENT OF ULTRASONIC VELOCITIES

Jack G. Parks, Troy, Mich., assignor to the United States of America as represented by the Secretary of the Army

Filed Sept. 24, 1969, Ser. No. 860,741
Int. Cl. G01n *29/02*
U.S. Cl. 73—67.2 **7 Claims**

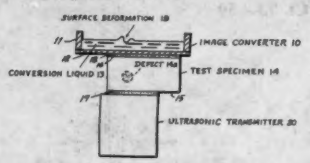


An electronic device and method for determining the velocity of propagation of compressional sound waves in non-dispersive liquids by measuring relationship between phase angle and frequency. The device uses a double crystal, fixed geometry, ultrasonic interferometer to measure the compressional wave velocities in the liquid.

3,572,088
DEVICE FOR CONVERSION OF ULTRASONIC IMAGES INTO VISIBLE DISPLAYS

Otto R. Gericke, Medfield, and Robert C. Grubinskas, Holliston, Mass., assignors to the United States of America as represented by the Secretary of the Army

Filed Feb. 20, 1968, Ser. No. 706,985
Int. Cl. G01n 29/04
U.S. Cl. 73—67.6 5 Claims

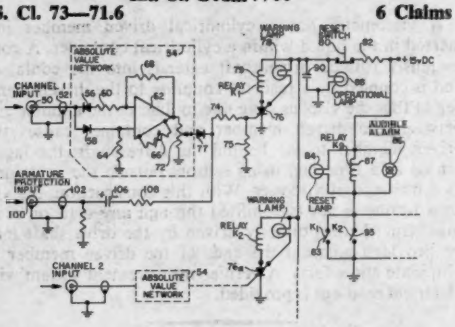


Apparatus for ultrasonic visualization of discontinuities in optically opaque materials wherein the test specimen is not immersed in a liquid medium.

3,572,089
PEAK ACCELERATION LIMITER FOR VIBRATIONAL TESTER

T. O. Paine, Acting Administrator of the National Aeronautics and Space Administration, with respect to an invention of Carl P. Chapman, La Crescenta, Calif.

Filed Feb. 4, 1969, Ser. No. 796,405
Int. Cl. G01m 7/00
U.S. Cl. 73—71.6 6 Claims



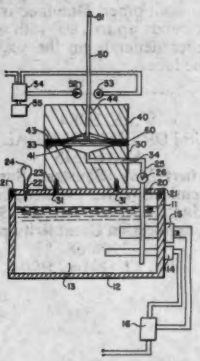
An electronic detection and protection system is provided for use with vibrational or dynamic testing apparatus for qualification of an object such as a spacecraft component, and for preventing damage to the object during testing. The system responds to peak accelerations of either polarity above a predetermined amplitude threshold, as perceived by tranducer means mounted on the object under test, to institute control effects such as deactivating the test apparatus or actuating alarm indicators, or both. The system also responds to the true root mean square current of the alternating current exciting signals flowing in the electrical drive of the test apparatus whenever a predetermined amplitude threshold is exceeded to initiate the same control effects so as to protect the electrical drive.

3,572,090
APPARATUS AND METHOD FOR TESTING PAPERBOARD

Richard M. Graham, Concord, and Gordon C. Wheeler, Walnut Creek, Calif., assignors to Fibreboard Corporation, San Francisco, Calif.

Filed June 3, 1968, Ser. No. 734,144
Int. Cl. G01m 3/26; G01n 5/02
U.S. Cl. 73—73 5 Claims

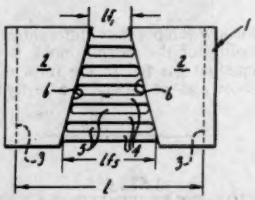
A device for measuring the rate at which liquids are absorbed into the cut edge of paperboard comprises mating top and bottom sections which engage a sample of paperboard at their peripheral edges and form an internal chamber with only a continuous cut edge of the paperboard exposed to liquid in the chamber. A source of liquid is provided to fill the chamber and a calibrated capillary tube is provided so that the rate of absorption may be determined by measuring the time required for a given amount of liquid to be absorbed.



3,572,091
MECHANICAL STRAIN INDICATOR

Keith H. McFarland, P.O. Box 328, Los Altos, Calif. 94022

Filed Sept. 27, 1968, Ser. No. 773,693
Int. Cl. G01n 3/00
U.S. Cl. 73—88 2 Claims



A device and method for measuring, indicating, and recording the strain produced in structural members when subjected to a force. A coupon comprising two thick end pieces and a thinner center membrane which is separated into fibers or ligaments of varying length. When attached to the member to be tested, the strain produced causes rupture of successive fibers starting with the shortest first, the actual strain being established as lying between that existing in the longest fiber to fail and the shortest one to remain whole. Variations in properties of material and geometries utilized and application of appropriate calibration permits determination of such parameters as stress, force, load, pressure, acceleration, torque, temperature, etc.

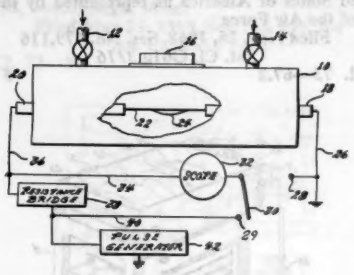
3,572,092
PULSED HOT WIRE SYSTEM

Louis Zernow, Glendora, Calif., assignor to the United States of America as represented by the Secretary of the Air Force

Filed June 16, 1969, Ser. No. 833,507
Int. Cl. G01n 25/00
U.S. Cl. 73—15 4 Claims

An apparatus for testing micro quantities of biological organisms or chemical compounds including a chamber

having a controlled atmosphere, a wire or conductive foil mounted in the chamber for supporting a specimen and connected electrically to a variable pulse generator and a



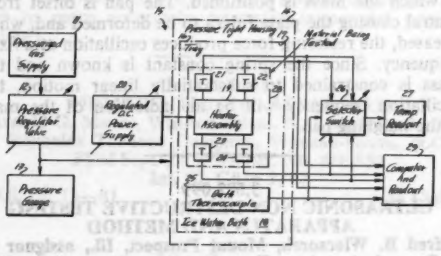
null balanced resistance bridge where the temperature-time history of the specimen can be maintained and measured simultaneously.

3,572,093

THERMAL TESTING INSTRUMENT

Harold S. Butler, Jr., Panama City, Roger K. Johnson, Lynn Haven, and Robert H. Payne, Jr., Panama City, Fla., assignors to the United States of America as represented by the Secretary of the Navy

Filed July 7, 1969, Ser. No. 839,443
Int. Cl. G01n *25/16*
U.S. Cl. 73—15 **11 Claims**



This invention is an instrument for measuring the thermal conductance of a material while it is located within a simulated water environment of various depths and pressures. A heater heats one side of said material to a temperature approximately human body heat. Said heater and material are submerged in a tray of ice water located in a pressure tight housing. Gas under controlled pressure conditions is used to pressurize the inside of said housing and, thus, apply water depth simulating pressures to both sides of said wetted material, so as to effect compression thereof in proportion thereto. While compressed temperature readings are taken with thermocouples located on the heater side of said material which effectively indicate the body heat loss therethrough to said ice water. The heat loss, if any, is proportional to the thermal conductance of the material at any given depth simulating pressure.

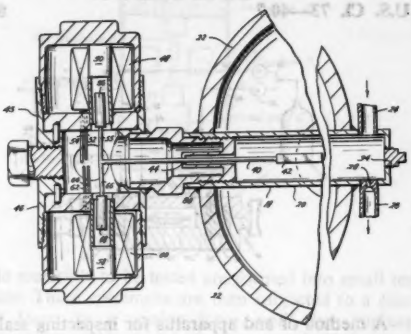
3,572,094

GAS DENSITY MEASURING APPARATUS

William B. Banks, Houston, Tex., assignor to Automation Products, Inc., Houston, Tex.

Filed Apr. 18, 1969, Ser. No. 817,364
Int. Cl. G01n *29/02*
U.S. Cl. 73—30 **4 Claims**

Apparatus for measuring the density of gas flowing through an orifice in a line having an enclosed sample chamber positioned inside of the line with its exterior in contact with the flowing gas so that the chamber temperature will be maintained at the temperature of the flowing gas, an inlet line supplying a sample of gas to be measured from the line on a first side of the orifice to the sample chamber and an outlet line having a restriction therein connected from the sample chamber to the line on a second side of the orifice thereby maintaining the gas in the sample chamber at approximately the pressure on the first side of the orifice, and a gas density measuring instrument in the sample chamber. Valves in the inlet and outlet lines and a passageway between the chamber and a point exteriorly of the pipeline for isolating the sample chamber and admitting a calibration gas to the chamber for calibration. The pipeline including an enlarged passageway into which the sample chamber is positioned thereby avoiding restricting gas flow through the pipeline by the sample chamber.

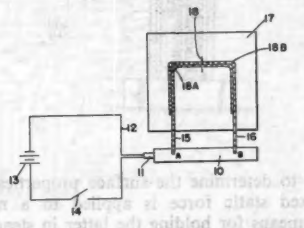


3,572,095

APPARATUS FOR MEASURING DETONATION VELOCITIES IN EXPLOSIVES

James F. Kowalick, Southampton, Pa., assignor to the United States of America as represented by the Secretary of the Army

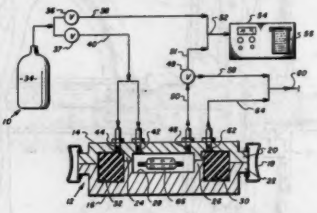
Filed Apr. 9, 1969, Ser. No. 814,728
Int. Cl. G01n *33/22*
U.S. Cl. 73—35 **4 Claims**



Two lengths of metal-sheathed explosive-detonating cord are placed on an aluminum plate in side by side position to form a double length portion of cord intermediate their ends. One end of each length of cord is secured to a body of explosive for initiation in response to detonation of the body. A detonator, attached to the body near one of the secured cord ends, detonates the body which initiates the cord lengths. Initiation fronts, travelling along the cord length, form offset or lateral marks in the aluminum plate where the fronts meet. The mark location relative to the cord lengths, detonation velocity of the cords

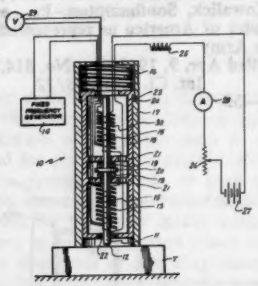
and the distance between the secured ends enables a very accurate determination of the detonation velocity of the explosive body.

3,572,096
METHOD AND APPARATUS FOR INSPECTING SEALED PACKAGES FOR LEAKS
Raymond A. Meyer, Thousand Oaks, Calif., assignor to North American Rockwell Corporation
Filed Dec. 23, 1968, Ser. No. 785,879
Int. Cl. G01m 3/16
U.S. Cl. 73—40.7 **8 Claims**



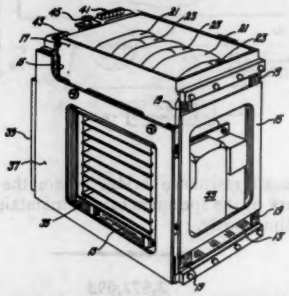
A method of and apparatus for inspecting sealed packages for leaks where a sealed package in an improved inspection fixture is exposed to a relatively low-pressure carrier gas for a short time period that results in a readout developed by a detector readout instrument which distinguishes gross, medium, and fine package leaks.

3,572,097
RESONANT SENSING DEVICES AND METHODS
Claud Kleesattel, 9841 64th Road, Forest Hills, N.Y. 11374
Filed May 7, 1968, Ser. No. 727,169
Int. Cl. G01n 29/00
U.S. Cl. 73—67.2 **17 Claims**



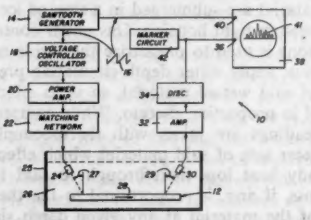
In order to determine the surface properties of a test piece a fixed static force is applied to a mechanical resonating means for holding the latter in steady contact with the test piece at a contact surface shaped to provide increasing areas of contact with increasing penetration thereof into the test piece surface, the mechanical resonating means is vibrated at a fixed frequency and, while being thus held in steady contact with the test piece and vibrated, a characteristic or parameter of the mechanical resonating means which determines its resonance frequency is varied to achieve its resonance at the fixed frequency of vibration, with the variation of such characteristic or parameter required to achieve resonance being measured as an indication of the surface properties, such as hardness, of the test piece.

3,572,098
MASS MEASURING INSTRUMENT SPRING SYSTEM
Joseph W. Fogwell, San Antonio, Tex., assignor to the United States of America as represented by the Secretary of the Air Force
Filed Nov. 26, 1968, Ser. No. 779,116
Int. Cl. G01g 3/16
U.S. Cl. 73—67.2 **5 Claims**



A spring system to provide a force for oscillating a mass at precise and repeatable frequencies including a pair of spaced parallel plate springs each having the lower end thereof attached to a fixed base plate. The upper and lower ends of each spring includes plate fulcra and the upper end is attached to and supports a weighing pan in which the mass is positioned. The pan is offset from neutral causing the plate fulcra to be deformed and, when released, the restoring force produces oscillation at a fixed frequency. Since the spring constant is known and the mass is constrained to substantially linear motion, the oscillation frequency will be an indication of the mass in the weighing pan.

3,572,099
ULTRASONIC NON-DESTRUCTIVE TESTING APPARATUS AND METHOD
Alfred B. Wieczorek, Mount Prospect, Ill., assignor to General American Transportation Corporation, Chicago, Ill.
Filed Aug. 23, 1968, Ser. No. 754,861
Int. Cl. G01n 29/00
U.S. Cl. 73—67.7 **26 Claims**



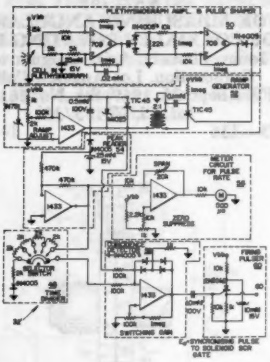
A continuous frequency-modulated electrical wave having a continuous frequency-modulation of a repetitive wave shape is generated and is converted into an ultrasonic transmitted wave which is continuous and frequency-modulated of the repetitive wave shape. The ultrasonic wave is impinged on an object such that a series of ultrasonic pulses each corresponding to a Lamb wave mode is induced therein. The ultrasonic pulses are converted to electrical test pulses which are then correlated with the modulating frequencies.

3,572,100

SYNCHRONIZER FOR A TONOMETER

Bernard Grolman, Worcester, and Robert G. Lavallee, Ashland, Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed May 28, 1969, Ser. No. 828,506
Int. Cl. A61b 3/16
U.S. Cl. 73—80 7 Claims



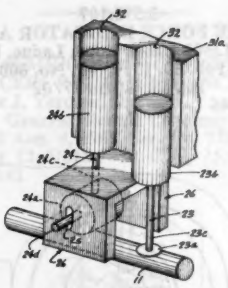
A synchronizer for an air-puff tonometer which through electronic control programs the firing of the air-puff after the trigger mechanism for the tonometer has been actuated. The instrument (combination of air-puff tonometer and synchronizer) is useful as a general diagnostic tool or to more accurately determine intraocular pressure (IOP).

3,572,101

FIRMNESS TESTING APPARATUS

Arnold G. Moore, Winston-Salem, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Sept. 24, 1969, Ser. No. 860,533
Int. Cl. G01n 3/42
U.S. Cl. 73—81 11 Claims



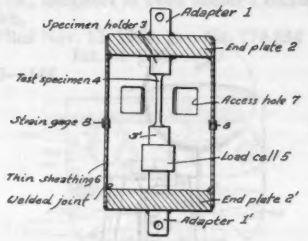
A testing apparatus is provided for use in testing the firmness of a tobacco rod or the like. The apparatus includes a frame for accommodating a rod to be tested, and a pair of sensing elements adjustably mounted on a carrier, the latter being movable relative to the frame so as to traverse the length of the accommodated rod. Each sensing element is adjustable and has an end thereof in contact with the periphery of the accommodated rod and imparts a predetermined force on the rod exterior. There is a predetermined differential in the force imparted on the rod exteriorly by said sensing elements. Electrical means are provided which are operatively connected to said sensing elements and measure the relative deflection of said sensing elements as they traverse the rod length.

3,572,102

FIXTURE FOR TESTING BRITTLE MATERIALS

Francis I. Baratta, 138 Ridge St., Arlington, Mass. 02174

Filed May 12, 1969, Ser. No. 823,879
Int. Cl. G01n 3/00
U.S. Cl. 73—93 4 Claims



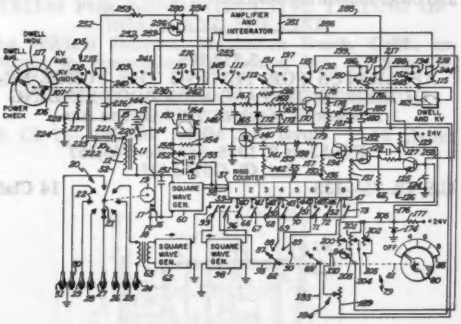
Brittle materials to be tested are formed into small test specimens. These specimens are then subjected to a compression force, or a tension force, until they rupture. The rupture or yield point is then recorded. If the compression or tension forces are slightly misaligned, bending or twisting of the specimen will cause premature rupture and inaccurate data as to the true strength of the material. This invention teaches simple apparatus, a yieldable thin cylinder around the specimen, to reduce such bending or twisting of the specimen.

3,572,103

ANALYZER FOR MULTI-CYLINDER INTERNAL COMBUSTION ENGINE HAVING MEANS FOR IDENTIFYING INDIVIDUAL CYLINDERS

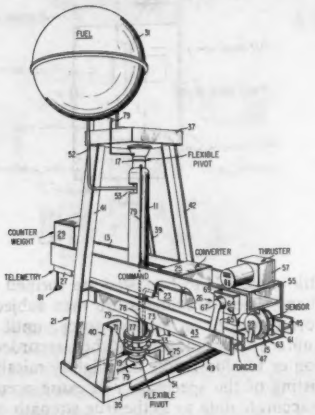
Joseph A. Marino, Hopkins, Minn., assignor to Marquette Corporation, Minneapolis, Minn.

Filed Jan. 6, 1967, Ser. No. 607,820
Int. Cl. G01m 15/00
U.S. Cl. 73—116 18 Claims



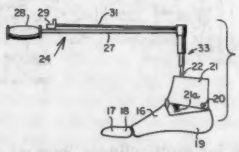
An analyzer for multicylinder internal combustion engines in which there is an electronic counter triggered by pulses from the ignition system and normally reset by the firing voltage applied to any of selected spark plugs in which the electronic counter has a plurality of stages corresponding to the number of cylinders in the engine and in which there is an electrical testing means adapted to be operated by the output signal of any one or more stages of the counter to produce an electrical effect for analyzing the performance of the engine.

3,572,104
MICRO-POUND EXTENDED RANGE THRUST STAND
Kenneth W. Stark, Hyattsville, Md., assignor to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration
Filed May 29, 1969, Ser. No. 828,909
Int. Cl. G01l 5/00
U.S. Cl. 73—117.4 **12 Claims**



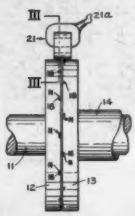
This disclosure describes a micro-pound extended range thrust stand comprising a vertical tubular member rotatably held at both ends by flexible pivots. A horizontal support beam is attached to the tubular member and supports a thruster package at one end. A counter weight is mounted on the other end of the support beam to balance the weight of the thruster package. A sensor is provided for sensing the movement of the beam caused by low level thrusts. And, a magnetic forcer is provided for counteracting higher level thrusts so that a null balance system is provided for testing higher level thrusts. Suitable electronic means are provided for controlling the operation of the thruster and for telemetering data from the sensor and other measuring devices.

3,572,105
APPARATUS FOR TESTING THE FORCE REQUIRED TO RELEASE A SKI BOOT BINDING
Frederic H. Kaehler, 1314 Owana Ave., Royal Oak, Mich. 48067
Filed July 9, 1968, Ser. No. 743,357
Int. Cl. G01l 5/03
U.S. Cl. 73—133 **14 Claims**



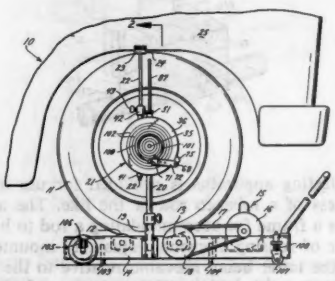
Apparatus for testing the force required to release a ski boot from a releasable binding, the apparatus comprising a foot-shaped force transmitting body adapted to be fitted into a ski boot mounted on a ski by a binding which is operable to release the boot in response to the imposition of predetermined forces on the boot in directions laterally and longitudinally of the ski. The foot-shaped body is articulated to simulate the action of the human foot and ankle and is provided with an accessible coupling device by means of which torsional forces in either of two mutually normal planes of rotation may be transmitted to the boot. The torsional forces may be applied by a conventional torque wrench.

3,572,106
MEANS FOR MEASURING ANGULAR DISPLACEMENT OF COAXIALLY ROTATING ELEMENTS
Robert P. Jonas, Phoenix, Ariz., assignor to The Garrett Corporation, Los Angeles, Calif.
Filed Sept. 26, 1969, Ser. No. 861,393
Int. Cl. G01l 3/10
U.S. Cl. 73—136 **11 Claims**



This torque meter has two disks disposed side by side and fixed to axially spaced points on a shaft, magnetic recordings of one configuration extending around the periphery of one disk and magnetic recordings of another configuration extending around the periphery of the other disk. It also has a single magnetic head disposed to sense the magnetic flux from the recordings on both rotating disks to produce two distinct signals appearing alternately with time. The signals from the magnetic head are fed to a circuit that responds to both signals to produce a rectangular wave wherein the difference between adjacent half cycles is related to the relative rotary movement of the disks.

3,572,107
RADIAL TIRE FORCE INDICATOR APPARATUS
Lee Hunter, 13501 Ladue Road, Ladue, Mo. 63141
Filed Feb. 20, 1969, Ser. No. 800,869
Int. Cl. G01m 17/02
U.S. Cl. 73—146 **5 Claims**



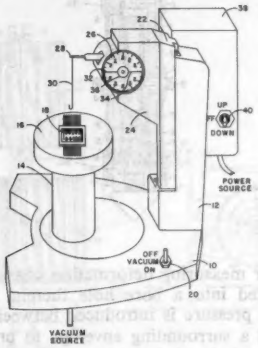
Apparatus for indicating the vehicle supporting strength characteristics of a tire which carries the weight of the vehicle adjacent thereto, and for locating the inequalities or weak areas in the tire construction. The apparatus includes means to engage and turn the vehicle tire at a low speed so as not to introduce suspension system responses, means to monitor the vehicle motion resulting

from variations in structural strength of the tire, and means associated with the monitoring means to display the tire strength and weaknesses throughout a complete revolution thereof and to compare such response to a theoretically uniform strength tire.

3,572,108
MEANS FOR TESTING WIRE BONDS IN MICROELECTRONIC CIRCUITS

Michael B. McShane, Costa Mesa, and Keramet O. Ucer, Newport Beach, Calif., assignors to Collins Radio Company, Dallas, Tex.

Filed June 5, 1969, Ser. No. 830,717
Int. Cl. G01l 5/00
U.S. Cl. 73—141 **2 Claims**

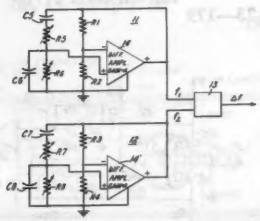


Apparatus for testing wire bonds in microelectronic circuits including a circuit holder and gauge means which is movably supported to travel towards or away from said circuit holder. The gauge means includes wire grasping means which is operatively connected to the gauge means. After grasping a wire in a microelectronic circuit on said circuit holder, the gauge means is moved away from the support means until the wire or bond fails, and the force required is registered by the gauge means.

3,572,109
INTEGRAL SEMICONDUCTOR STRAIN GAGE TRANSDUCERS WITH FREQUENCY OUTPUT

Alexander J. Yerman, Scotia, N.Y., assignor to General Electric Company

Filed Aug. 9, 1968, Ser. No. 751,426
Int. Cl. G01b 7/20; G01p 15/08
U.S. Cl. 73—141 **8 Claims**

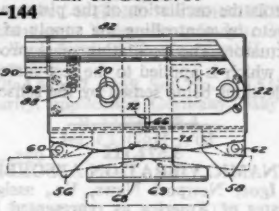


A precise instrument transducer having an analog frequency output as a function of applied force comprises two identical Wien bridge oscillators with integral single crystal semiconductor strain gages arranged to produce approximately equal and opposite resistance changes in the two oscillators so that the resulting frequency changes are additive. Applied as an accelerometer the gage pairs are on opposite sides of a cantilever beam, and as a load cell are oriented in different directions on (100) cut silicon where, together with the other circuit elements, they can be fabricated by integrated circuit techniques.

3,572,110
TENSION INDICATOR

David W. James, Dearborn, Mich., and Roy LoPresti, Chicago, Ill., assignors to Ford Motor Company, Dearborn, Mich.

Filed Nov. 12, 1968, Ser. No. 774,854
Int. Cl. G01l 5/10
U.S. Cl. 73—144 **9 Claims**

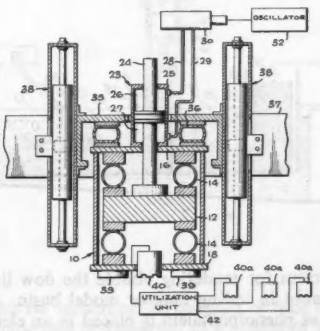


The tension in automotive V-belts is indicated by a device that deflects the belt between two rollers fastened to a leaf spring. Two microswitches, one of which is normally closed and the other normally open, are actuated by the resulting deflection of the spring. The microswitches are electrically in series with each other and with a light bulb and the normally open switch is preset to close when a predetermined minimum tension is reached while the normally closed switch is preset to open when a predetermined maximum tension is reached. Thus the light bulb will be turned on when the tension in the belt is within a predetermined range. Quantitative measurements of the tension can be obtained by fastening strain gauges to the spring and connecting the strain gauges through a bridge-type circuit to a meter reading directly in tension units. The tension indicator is operated by hand and contains an efficient latching mechanism for maintaining a predetermined amount of deflection in the belt during measurement.

3,572,111
SYSTEM FOR NONDESTRUCTIVE TESTING OF ROADS AND THE LIKE

John William Johnson, Manhattan Beach, Calif., assignor to Foundation Mechanics, Inc., El Segundo, Calif.

Filed Sept. 18, 1969, Ser. No. 859,065
Int. Cl. E01c 19/30
U.S. Cl. 73—146 **10 Claims**



A nondestructive road testing system comprising a housing in which a vibratory mass is positionable at a null position by means of sets of balanced air springs. The

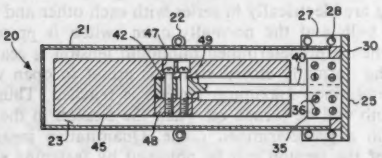
housing is coupled to the bumper of a vehicle, such as a truck, through hydraulic elevator cylinders, which lower the housing onto a test surface and raise it therefrom. The housing supports a sensor which comes in contact with the test surface when the housing is positioned thereon, thereby applying a static force thereto. The force produces a deflection in the surface which is sensed by the sensor and which is measured and/or recorded. The vibratory mass is coupled to a piston in a double chamber hydraulic actuator. A sinusoidal alternating current from an electrical oscillator is supplied to a control valve which in turn controls the oscillation of the piston and the mass coupled thereto by controlling the supply of fluid to the hydraulic actuator. The oscillating mass produces a dynamic force which is applied to the test surface, with the resulting deflections being sensed by the sensor.

3,572,112

DYNAMIC VIBRATION ABSORBER

William B. Igoe, Newport News, Va., assignor to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed June 30, 1969, Ser. No. 837,825
Int. Cl. G01m *9/00*
U.S. Cl. 73—147 **10 Claims**



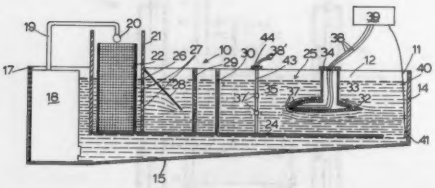
A tuned damped vibration absorber for a mass vibrating in more than one degree freedom of motion. It consists of a cantilever spring and attached mass designed so that they will absorb vibrations simultaneously at different frequencies in corresponding different degrees of motion.

3,572,113

HYDRAULIC MODEL TESTING TANK WITH ELECTRICAL TRACING INDICATOR

Eugene Carl Huebschman, 1100 Bragg Circle, Tullahoma, Tenn. 37388

Filed Apr. 1, 1969, Ser. No. 811,898
Int. Cl. G01m *10/00*
U.S. Cl. 73—148 **9 Claims**



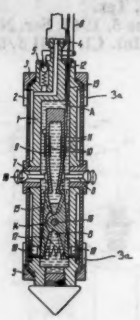
An apparatus for rendering visable the flow lines past a model placed in testing tank or model basin. An indicator such as phenolphthalein is placed in an electrolytic solution. Electrodes located on the model are energized so that a local change in pH results producing streaks of indicator solution for studying the flow lines about the model.

3,572,114

DEVICE FOR EVALUATING DEFORMATION CHARACTERISTICS OF ROCKS IN SITU

Konstantin Vladimirovich Ruppeneit, Tovarischesky per. 8, kv. 8; Evgeny Semenovich Prigozhin, Ul. Glagoleva 24, korp. 2, kv. 14; and Jury Rodionovich Perkov, Sportivnaya ul. 6, kv. 2, all of Moscow, U.S.S.R.

Filed Aug. 12, 1968, Ser. No. 751,779
Int. Cl. E21b *49/00*
U.S. Cl. 73—151 **3 Claims**



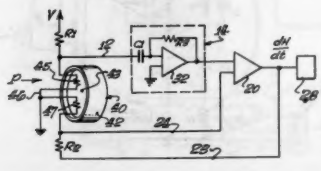
A device for measuring deformation characteristics or rocks is inserted into a bore hole therein and a fluid medium under pressure is introduced between a body of the device and a surrounding envelope to pressurize the walls of the bore holes. A feeler is extended from the body to contact the wall of the bore to follow its deformation under the action of the fluid medium and a measuring device is coupled to the feeler to measure its displacement. The measuring device is released by grips when measurement is being made so as to be floating in a chamber in the body and suspended by the feeler from the wall of the bore hole. The chamber is filled with a dielectric liquid lighter than water and the measuring device is in the upper portion of the chamber and above an aperture in which the feeler travels so that if water enters the chamber through the aperture, the measuring device will remain protected by the dielectric liquid.

3,572,115

ALTITUDE RATE TRANSDUCER AND COMPUTING CIRCUIT

Robert Feuer, Wayne, N.J., assignor to Conrac Corporation, New York, N.Y.

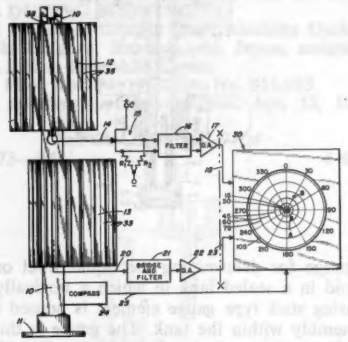
Filed Aug. 12, 1969, Ser. No. 849,366
Int. Cl. G01c *21/00*
U.S. Cl. 73—179 **5 Claims**



An altitude rate signal is developed electronically by differentiating a static pressure signal P and solving the equation $dH/dt=-(K/P)\cdot(dP/dt)$ by linear operations which include representing the product of P by a variable voltage. In one modification a piezoresistive static pressure transducer is energized by the voltage, and the transducer output is utilized to represent the product. Another

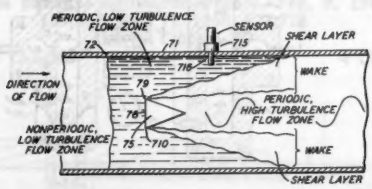
modification represents the product by linear circuitry capable generally of deriving any function of the form AB/C from input signals representing A, B and C. Two choppers are driven synchronously with variable on-off ratio. Circuitry including one chopper maintains the chopping ratio proportional to B/C, while the other chopper multiplies that function by A.

3,572,116
SEMICONDUCTOR WIND SPEED AND DIRECTION SENSOR
John E. Penn, 5441 E. 16th St., Indianapolis, Ind. 46218
Filed Oct. 24, 1969, Ser. No. 869,033
Int. Cl. G01w *1/02*
U.S. Cl. 73—189 **7 Claims**



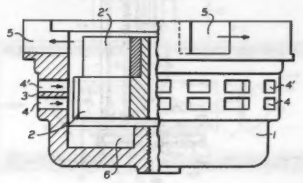
A semiconductor wind speed and direction sensor having two cylindrical wind drag units eccentrically supported on torque responsive strips, each with the diameter in alignment with the eccentricity and being normal or at 90° to each other and with silicon semiconductor strain gages mounted on the torque responsive material strips to sense and produce electric signals representative of drag unit torque movement in response to and proportional to the wind direction and the square of wind velocity.

3,572,117
BLUFF BODY FLOWMETER
Alan E. Rodely, Watchung, N.J., assignor to Eastech, Inc., Watchung, N.J.
Filed May 27, 1968, Ser. No. 732,238
Int. Cl. G01p *1/00*
U.S. Cl. 73—194 **19 Claims**



Flowmeters utilizing nonstreamlined, bluff bodies and sensors are disclosed for generating oscillating wakes in a fluid flowing through a pipe to produce high signal-to-noise signals which are free from intermittency and are sensed outside of the wake in the flow near and upstream from the bodies. Each of the bodies comprises prescribed geometric configurations and includes a base surface facing the flow and downstream surfaces to control the oscillatory flow. The bodies each have sharp upper and lower corners at the edges of the facing base surface for defining separation lines for the flow. The facing base surfaces are selectively blunt or convex for reducing pressure loss in the pipe due to the bluff body.

3,572,118
TURBINE-WHEEL WATERMETER
Wilfried Hilzendegen, Weingarten, Baden, Germany, assignor to Paul Neuhoff & Co. GmbH, Weingarten, Baden, Germany
Filed May 7, 1969, Ser. No. 822,517
Claims priority, application Germany, May 25, 1968, P 17 73 498.4
Int. Cl. G01f *1/08*
U.S. Cl. 73—229 **3 Claims**



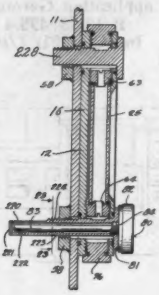
An improved turbine-wheel type meter comprises two freely rotatable turbine meter wheels on a common shaft in a suitable housing. The wheels are angularly adjustable with respect to one another from a matching position to one of maximum offset. A multiplicity of paired inlet orifices around the periphery of the housing direct the fluid to be measured tangentially against the blades of one of the wheels, and outlet passageways remove discharged fluid from the vanes of the other wheel.

3,572,119
FLUID QUANTITY INDICATING DEVICE
Aloysius Bak, Davenport, Iowa, assignor to The Bendix Corporation
Filed Aug. 7, 1969, Ser. No. 848,290
Int. Cl. G01f *23/28*
U.S. Cl. 73—290 **6 Claims**

A device for indicating the quantity of fluid in a vessel. A waveguide that is connected to a source of microwave energy is extended in the fluid with the fluid being present in the waveguide at a level equal to the fluid level in the vessel. A node is created at the lower end of the waveguide by a shorting bar. A detector that is responsive

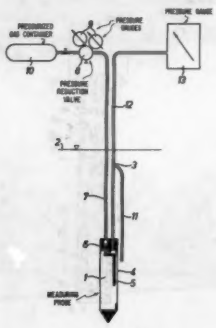
to mircowave energy is connected to the waveguide to detect changes in another mode location within the waveguide due to changes in fluid level in the vessel and waveguide.

3,572,120
LIQUID LEVEL GAUGE
Gus J. Lukas and Floyd J. Bydalek, Manitowoc, Wis., assignors to Lube Devices, Inc., Manitowoc, Wis.
Continuation-in-part of applications Ser. No. 407,710, Oct. 30, 1964, now abandoned, and Ser. No. 670,696, Sept. 26, 1967, now Patent No. 3,455,163, dated July 15, 1969. This application June 12, 1969, Ser. No. 832,707
Int. Cl. G01f 23/02
U.S. Cl. 73—292 8 Claims



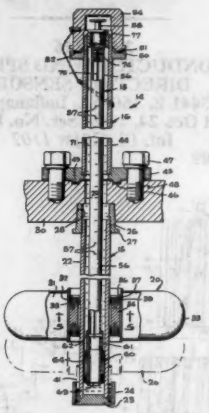
A combination liquid level gauge and dial thermometer adapted to be mounted upon a tank in which the dial thermometer is visible from the front of the gauge but has a sensor which is in heat transmitting relation to the liquid.

3,572,121
DEVICE FOR PNEUMATICALLY MEASURING LIQUID LEVELS
Zsolt Kesseru, Tibor Willems, and Istvan Bagdy, Budapest, Hungary, assignors to Nikex Nehezipari Kulkereskedelmi Vallalat, Budapest, Hungary
Filed Sept. 16, 1969, Ser. No. 858,377
Claims priority, application Hungary, Sept. 16, 1968, 11,827
Int. Cl. G01c 23/14
U.S. Cl. 73—302 1 Claim



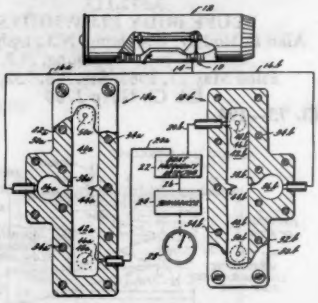
An arrangement for measuring liquid levels by pneumatic means, equipped with a gas bottle and a measuring probe which is connected to the pipe system dipping beneath the surface of the liquid and consisting of a feed pipe and a measuring pipe, said probe controlling the supply of gas under pressure and being provided with a diaphragm.

3,572,122
MEASURING STICK TYPE GAUGE
Henry Nusbaum, Los Angeles, Calif., assignor to Roylyn Incorporated, Glendale, Calif.
Filed July 28, 1969, Ser. No. 845,191
Int. Cl. G01f 23/06
U.S. Cl. 73—314 6 Claims



A gauge for determining the liquid level or quantity of liquid in a sealed tank in which a vertically movable measuring stick type gauge element is housed in a tubular assembly within the tank. The gauge is thus isolated from the contents of the tank. A float operable in the tank is provided on the exterior of the tubular assembly and includes a magnetic device for attracting, or magnetically latching, a particular section of the gauge element having a magnetic device thereon to the float for the purpose of orienting the element with respect to the float.

3,572,123
FLUIDIC TEMPERATURE SENSING SYSTEMS
Willis A. Boothe, Scotia, N.Y., and William L. Phipps, Cincinnati, Ohio, assignors to General Electric Company
Filed Jan. 2, 1968, Ser. No. 695,277
Int. Cl. G01k 3/00
U.S. Cl. 73—339 7 Claims



The disclosure shows a fluidic temperature sensing system which comprises two fluidic temperature sensors connected to a common fluid source. Flow of fluid through the sensors provides output signals having pressure variations, the frequency of which is proportionate to fluid temperature. When there is a step change in temperature, the difference in frequency between the two signals, at the end of their short term time constants, accurately reflects

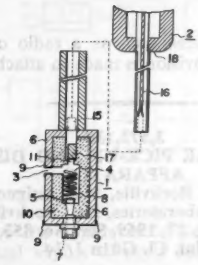
the actual change in fluid temperature before either sensor has reached a steady state condition, reflecting the temperature change. Also the rates of changes of the sensors during their short and long term time constants may be set to generate a temperature function signal and provide a leading relationship in which the frequency difference at the expiration of the short term time constants is greater than at the new steady state conditions. A fluidic beat detector provides an output signal proportionate to the difference in frequency of the two sensor signals. This output signal is employed to provide an analogue readout having a minimum response time.

3,572,124

APPARATUS FOR SIMULTANEOUS DETERMINATION OF CARBON-TEMPERATURE IN LIQUID STEEL DURING BLOWING

Noriyoshi Nagaoka, Genichi Usui, Akichika Ozeki, and Moriyuki Ishiguro, Kawasaki-shi, Japan, assignors to Nippon Kokan Kabushiki Kaisha

Filed Apr. 14, 1969, Ser. No. 815,955
Claims priority, application Japan, Apr. 15, 1968, 43/24,890
Int. Cl. G01k *1/00, 7/04*
U.S. Cl. 73—341 4 Claims



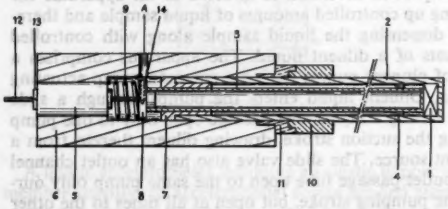
In a sampling vessel for receiving liquid steel during blowing, independent thermocouples are mounted on the inside of the bottom of said vessel and purging air is ejected through the side aperture of said vessel through an auxiliary lance supporting said vessel. A permeable stopper is provided at the top of the vessel which permits free flow of said purging air but prevents counter flow of liquid steel in said vessel.

3,572,125

DILATOMETRIC COUPLING DEVICE FOR VERY HIGH TEMPERATURE (3000° C.) REGULATION

Jacques C. Maire, Epinay-sur-Seine, and Jean Pierre M. Slonina, Le Vesinet, France, assignors to Le Carbone Lorraine, Paris, France

Filed Jan. 24, 1969, Ser. No. 793,744
Claims priority, application France, Feb. 9, 1968, 139,215; Dec. 11, 1968, 177,722
Int. Cl. G01k *5/50*
U.S. Cl. 73—363 4 Claims



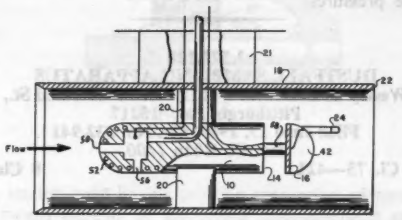
A device for the measurement of high temperatures up to about 3000° C. comprises a stack of graphite pseudomonocrystals about 50 mm. high. The stack is enclosed between an outer fixed cylindrical sheath of vitreous carbon and an inner movable sheath of vitreous carbon, and arranged in an assembly comprising a carbon push rod and a displacement detector so as to detect the expansion of the stack along the *c* axis only, this expansion being converted into a longitudinal displacement of the inner sheath.

3,572,126

ALTITUDE MEASURING DEVICE

Douglas F. White, Bedminster, N.J., and Marvin D. Scadron, Glenview, and Joseph C. Faul, Melrose Park, Ill., assignors to American Standard Inc., New York, N.Y.

Filed June 17, 1968, Ser. No. 737,717
Int. Cl. G01c *21/00*
U.S. Cl. 73—384 15 Claims



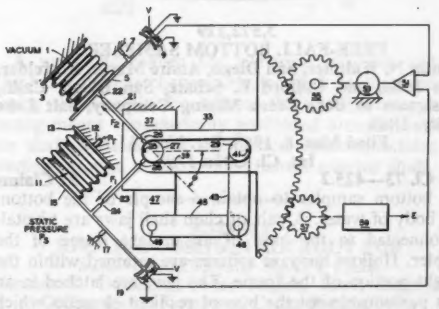
The airspeed of an airplane is determined by means of a device which includes an upstream cylindrical member and a downstream disc-like member spaced from said cylindrical member by a predetermined distance. Oscillations are produced in the air which passes around the cylindrical and disc structures and the frequency of the oscillations are measured. The frequency of the oscillations is directly related to the velocity of the fluid thus providing a direct determination of air speed. The altitude of the airplane is computed with great accuracy, by measuring directly, the total air temperature and air stagnation pressure in addition to the airspeed, and using these quantities in standard formulas well known to those versed in the art.

3,572,127

FRICTION FREE FORCE VECTOR PRESSURE RATIO SENSOR

William E. Brandau, Westwood, N.J., assignor to The Bendix Corporation

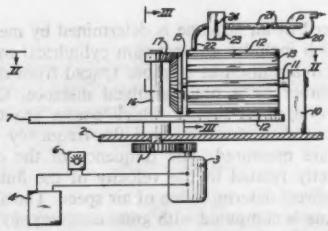
Filed May 27, 1969, Ser. No. 828,267
Int. Cl. G01l *7/06*
U.S. Cl. 73—407 7 Claims



A force vector pressure ratio sensor has a carriage adapted to pivot about a first axis and has a pulley rotatably mounted on the carriage. A second pulley is con-

nected to the first pulley by a non-slip belt and has a movable axis normally coincident with the first axis. A change of pressure ratio causes the second pulley to be displaced about the first pulley and a pair of sensors detect the displacement and provide signals corresponding thereto. A servo is responsive to the sensor signals for causing the carriage to pivot about the first axis until the axis of the second pulley is coincident with the first axis and the angular position of the carriage corresponds to the pressure ratio. Friction free displacement of the second pulley is provided by extensive use of flex pivots in combination with the belt and pulley arrangement. A linkage assembly programs the rotation of the first pulley relative to the carriage thereby eliminating any errors in the carriage position caused by friction between the first pulley and the carriage. The angular position of the carriage, which is free of frictional errors, corresponds to the ratio of the pressures.

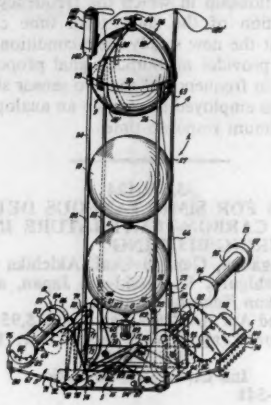
3,572,128
DUSTFALL SAMPLING APPARATUS
Wesley C. L. Hemeon, 5618 Northumberland St., Pittsburgh, Pa. 15217
Filed June 13, 1969, Ser. No. 832,941
Int. Cl. G01n *1/00*
U.S. Cl. 73—421 **8 Claims**



A series of wipers are disposed above a smooth horizontal surface that collects falling dust. Periodically, wiping movement is effected between the collecting surface and each wiper in succession so that the dust is removed from that surface and retained on the wiper engaging it. This wiper then is moved to a storage position and the next wiper is moved into contact with the collecting surface. Means are provided for removing the dust from each successive wiper in storage position and for measuring the quantity of dust so removed.

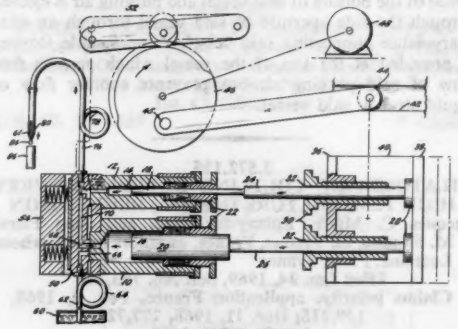
3,572,129
FREE-FALL BOTTOM SAMPLER
Thomas N. Walthier, San Diego, André Marcel Rosfelder, La Jolla, and Clifford E. Schatz, San Diego, Calif., assignors to Bear Creek Mining Company, Salt Lake City, Utah
Filed Mar. 8, 1968, Ser. No. 711,792
Int. Cl. G01n *1/08*
U.S. Cl. 73—425.2 **21 Claims**

A bottom sampler to obtain a sample of the bottom of a body of water. A pair of clam shell jaws are pivotally connected to the base of an upright frame of the sampler. Hollow buoyant spheres are retained within the upright portion of the frame. The jaws are latched in an open position against the bias of resilient elements which close the jaws when the latch is released in response to impact with the bottom. Two weights, one on the back of each jaw stabilize the sampler during descent and fall off when the jaws close. A camera located within one of the hollow spheres photographs the bottom of the body of water from which the sample is taken. A unique signal-flare and smoke producing device automatically actuates when the sampler returns to the surface. Other day



or night signal devices such as a radio or flasher can also be used and provision is made to attach such devices to the sampler.

3,572,130
LIQUID SAMPLE PICK-UP AND DISPENSING APPARATUS
Herbert Goldsmith, Rockville, Md., assignor to National Instrument Laboratories, Inc., Rockville, Md.
Filed Aug. 27, 1969, Ser. No. 853,415
Int. Cl. G01n *1/14*
U.S. Cl. 73—425.6 **4 Claims**



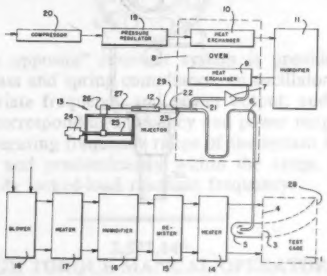
The present invention is directed to an apparatus for sucking up controlled amounts of liquid sample and thereafter dispensing the liquid sample along with controlled amounts of a diluent liquid. The apparatus comprises a pair of plunger pumps having a common pump actuating means. Diluent liquid enters the pumps through a slide valve having a liquid inlet passage open only to one pump during the suction stroke, drawing diluent thereto from a diluent source. The slide valve also has an outlet channel and outlet passage tube open to the same pump only during the pumping stroke, but open at all times to the other pump. The suction stroke of the pumps serves to draw diluent into the one pump from the inlet passage and at the same time sucks diluent back from the outlet passage into the other pump, and draws a small controlled quantity

of sample up into the end of the outlet passage tube. During the pressure stroke diluent is pumped from both pumps into the outlet passage tube expelling all of the sample therefrom as well as a controlled amount of diluent. A lost motion pump actuating means is provided so that the slide valve shifts when no pumping occurs.

3,572,131
METHOD AND APPARATUS FOR MEASURING THE INSECT REPELLENT PROPERTIES OF CHEMICAL VAPORS

Robert H. Wright, Francis E. Kellogg, and Donald J. Burton, Vancouver, British Columbia, and Philip N. Daykin, Edmonton, Alberta, Canada, assignors to the United States of America

Filed June 30, 1969, Ser. No. 840,899
Claims priority, application Canada, Dec. 12, 1968, 37,578
Int. Cl. G01n *33/00*
U.S. Cl. 73—432 **13 Claims**

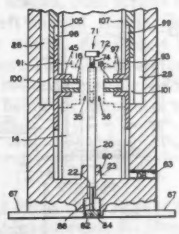


A method of and apparatus for testing the ability of various chemical vapors to repel mosquitoes and other biting insects by injecting into a cage containing such insects two differing temperature controlled humidified streams of air, one an environmental stream and another stream introduced into the environmental stream, the latter containing the vapor of said chemicals and measuring the intrinsic repellency of said chemicals.

3,572,132
FLUIDIC ACCELEROMETER

Leonard A. Trugman, Ridgewood, N.J., assignor to The Bendix Corporation

Filed Nov. 1, 1968, Ser. No. 772,677
Int. Cl. G01p *15/02*
U.S. Cl. 73—515 **5 Claims**

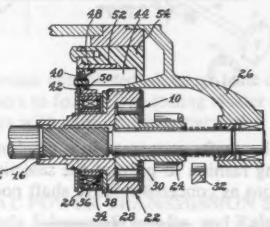


A fluidic accelerometer including an elastic flapper valve member sensitive to accelerational forces applied along an axis transverse the flapper valve member to cause deflection of the flapper valve member so as to unbalance a fluidic bridge circuit which gives rise to a differential pressure at outputs of the accelerometer. The fluidic bridge circuit includes two flow matched restrictors and two control nozzles operated by the flapper valve member in response to the accelerational forces applied to the flapper valve member along the sensitive axis thereof.

3,572,133
STARTER DRIVE WITH POSITIVE ADVANCE AND INERTIA RELEASE

Paul F. Giometti, Horseheads, N.Y., assignor to The Bendix Corporation

Filed Apr. 4, 1969, Ser. No. 813,455
Int. Cl. F02n *11/00*
U.S. Cl. 74—7 **10 Claims**

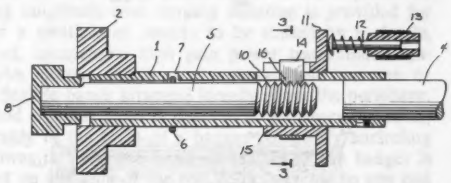


A starter drive having position responsive advance assist means capable of preventing disengagement of the drive in the event of a false start. The assist means comprise, in the preferred embodiment, an axially-movable electromagnetic brake with a non-rotating coil and magnet body. As the drive advances, an electrical contact for the coil slides along a conducting strip which terminates immediately before the drive reaches its fully advanced position de-energizing the brake and thereby releasing the advance assist.

3,572,134
TUNER MECHANISM FOR TELEVISION AND THE LIKE

Julius Kemeny, Suffolk, Va., assignor to General Electric Company

Filed Sept. 30, 1969, Ser. No. 862,650
Int. Cl. F16h *35/18*
U.S. Cl. 74—10.85 **3 Claims**



A tuner mechanism for television receivers and the like has a tubular channel selector shaft. A threaded fine tuning shaft within the selector shaft reciprocates a fine tuning means concentrically positioned around the selector shaft by means of mechanical interconnections extending through a slot in the channel selector shaft.

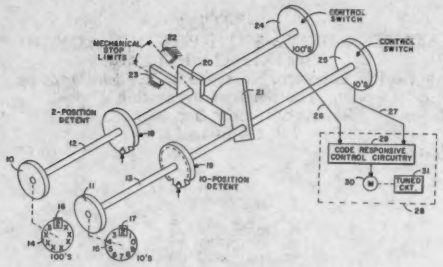
3,572,135
RELATED POSITION LOCKOUT FOR STEP-POSITIONED SHAFT PAIR

Winston F. Williams, Cedar Rapids, Iowa, assignor to Collins Radio Company, Cedar Rapids, Iowa

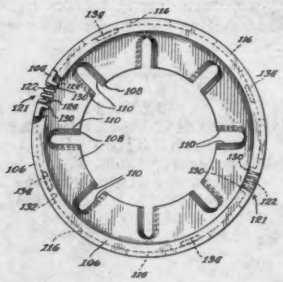
Filed Oct. 21, 1969, Ser. No. 867,996
Int. Cl. F16h *35/18*
U.S. Cl. 74—10.54 **4 Claims**

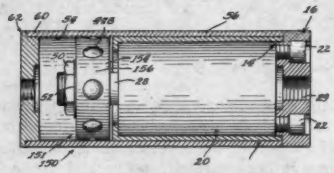
This invention comprises a combination camming and locking means for a pair of shafts which are positionable

to predetermined relative angular positions. A dog member mounted for rotation with one of the shafts and a sector camming member mounted for rotation with the other of the shafts cooperate in a combination camming and locking fashion to prevent the selection of particular permutations as concerns relative shaft positions.



3,572,136
LINEAR ACTUATOR
Richard B. Stanley, 4 Coventry on Duxbury, Plum Grove Village, Rolling Meadows, Ill. 60008
Filed Mar. 17, 1969, Ser. No. 807,506
Int. Cl. F16h *21/16*
U.S. Cl. 74—25 **6 Claims**



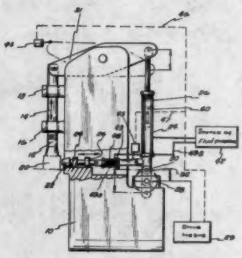


A device for converting rotary motion to linear motion in which a shaft member and a tubular member are mounted in concentric telescoping relation, and a bearing unit in the form of a plurality of bearing balls rolling on the tubular member and mounted in a special cage or retainer is interposed between the shaft member and the tubular member, and a wedge lock is established between the shaft member and the bearing balls that wedge locks the balls between the two members. The bearing unit is mounted in a fixed plane disposed transversely of the device shaft and tubular member, and the balls are spaced equidistantly about the axes of said members and rotate about individual axes that are canted at an acute angle on the order of two degrees out of parallelism with the longitudinal axes of said members.

3,572,137
SLIDE DRIVE MECHANISM FOR A PRESS
Kohji Nakano, Kanagawa-ken, Japan, assignor to Kabushiki Kaisha Aida Tekkosho, Sagamihara-shi, Kanagawa-ken, Japan
Filed May 21, 1969, Ser. No. 826,475
Int. Cl. F16h *21/22*
U.S. Cl. 74—44 **2 Claims**

A slide drive mechanism for a press in which a slide actuating shaft is provided with an eccentric sheave adapted to cause a connecting rod connected to the slide of the press to reciprocate. The slide actuating shaft has imparted thereto a non-constant angular velocity movement from a drive shaft which rotates at a constant angular velocity and imparts a non-constant angular velocity rotational movement to the slide via an intermediate transmission means.

3,572,138
RECIPROCATING DRIVE
Marcus J. Auernhammer, Engleside, Mich., assignor to Visi-Trol Engineering Company, Detroit, Mich.
Filed Jan. 10, 1969, Ser. No. 790,424
Int. Cl. F16h *21/18*
U.S. Cl. 74—50 **16 Claims**



Various drive line arrangements for connecting a tool to a rotating drive shaft in order to provide a controlled, reciprocating tool motion with a pneumatic overload device protecting the drive shaft when the tool becomes jammed or is subjected to an abnormal load.

3,572,139

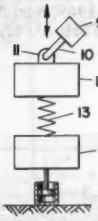
LOAD OPPOSITE RESONANT SYSTEMS

Howard L. Shatto, Jr., 5890 La Jolla Corona Drive, La Jolla, Calif. 92037, and Peter V. H. Serrell, 344 S. Granados, Solana Beach, Calif. 92075

Continuation-in-part of application Ser. No. 795,643, Jan. 31, 1969. This application Mar. 27, 1969, Ser. No. 813,803

Int. Cl. B06b *3/00*; F16h *33/20*

U.S. Cl. 74—87 9 Claims



A "load opposite" resonant system is provided with selected mass and spring compliance, an oscillator having an appropriate frequency and power output, and an engine with corresponding frequency and power output such that the operating frequency range of the system is in the region of, and predominately within the range and influence of its locked-load resonant frequency.

3,572,140

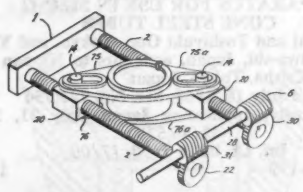
HIGH TORQUE MANUAL OPERATOR

Ronald A. Gulick, Houston, Tex., assignor to Research Engineering Corporation

Filed Mar. 14, 1969, Ser. No. 807,346

Int. Cl. F16h *1/18, 27/02*

U.S. Cl. 74—89.15 5 Claims



An operator having an output member linked to an input shaft in the following manner. Linkages join the member to nuts that are threadedly engaged to oppositely spaced longitudinal screws, both screws being of the same turn, i.e., right or left handed. Similar ends of the screws are keyed to worm wheels, the wheels being of opposite turn one to the other. The wheels are engaged with dual worms positioned toward opposite ends of a common shaft, the worms being of opposite turns. This shaft serves as an input shaft.

3,572,141

ROLLER-BAND DEVICES

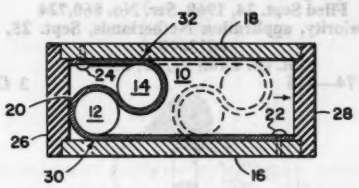
Donald F. Wilkes, Albuquerque, N. Mex., assignor to the United States of America as represented by the United States Atomic Energy Commission

Original application Nov. 15, 1967, Ser. No. 683,375, now Patent No. 3,471,668, dated Oct. 7, 1969. Divided and this application Mar. 26, 1969, Ser. No. 840,566

Int. Cl. F16h *55/34*

U.S. Cl. 74—89.22 6 Claims

A roller-band device which minimizes sliding friction, having rotatable members in a guideway with walls thereof spaced apart less than the summation of the diameters of the members for supporting the members, and resilient band means under tension between the guideway walls



with a band portion convoluted about at least one of the rotatable members to form a free-rolling cluster and maintain the members with axes generally parallel.

3,572,142

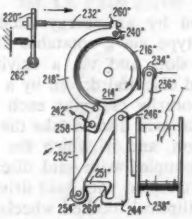
MECHANICAL POWER TRANSMISSION SYSTEM

Reynold Benjamin Johnson, Palo Alto, and Ralph Eugene Marrs, Campbell, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 2, 1969, Ser. No. 829,642

Int. Cl. F16h *27/00*

U.S. Cl. 74—112 4 Claims

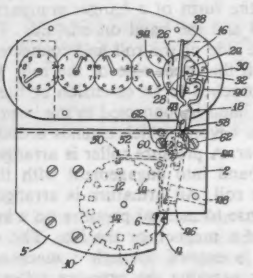


A higher mechanical force over uniform distance in response to mechanical pressures or electric pulses of varying amplitude over varying duration is provided for one or a multiple of devices to be shifted by a simple, compact, inexpensive high gain power transmission system. An electric motor driven power roll has one or more flexible bands arranged loosely about the periphery. One end of each band is coupled to an operating lever, preferably in the form of a hanger compactly encircling the power roll and the band on one side. The hanger is pivoted on one side of the roll and connected to one end of the band on the other side of the roll. The device to be shifted is attached to an extension of the hanger near the pivot. The band is connected to the lever on the other side of the roll beyond which extends a disengaging portion of the lever. A pressure roller is arranged on an arm to press the band into engagement with the peripheral surface of the roll. An armature is arranged for movement in response to manual pressure on a key or electric energization of a magnet, or the like. The movement of the armature is exerted through a mechanical latch to cause the arm carrying the pressure roller to press the band into frictional contact with the moving power roll. The band then pulls the lever in a direction for shifting the device as desired and opening the mechanical latch through action of the disengaging extension of the lever. Thus uniform travel of the device to be shifted obtains from applied force which is not necessarily uniform as to time or amplitude or distance traveled.

3,572,143
SWITCHES DRIVEN BY STRETCHABLE ENERGY ACCUMULATORS OF THE CRANKSHAFT-SPRING TYPE
Gerardus A. van Riemsdijk, Nijmegen, Netherlands, assignor to Smit Nijmegen Electrotechnische Fabrieken N.V., Nijmegen, Netherlands
Filed Sept. 24, 1969, Ser. No. 860,724
Claims priority, application Netherlands, Sept. 25, 1968, 6813678
Int. Cl. E16h *27/02, 29/00*
U.S. Cl. 74—116 3 Claims

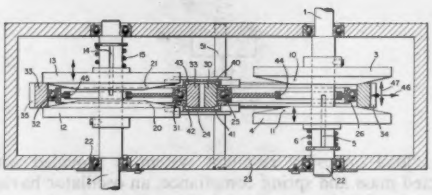
A switch driven by an energy accumulator of the crankshaft-spring type via a rotatable disc having equiangularly spaced slots and via a driving member cooperating with said disc and driven by a shaft, said driving member temporarily engaging each time, during its movement, a slot of said disc to take the latter along for its stepwise rotation, and in which the movable switch part is positively coupled with said disc and the crankshaft is positively coupled with said driving member via two cooperating elliptical toothed wheels.

3,572,144
ACTUATING MECHANISM
Donald J. Lemens, South Milwaukee, Wis., assignor to McGraw-Edison Company, Elgin, Ill.
Filed Apr. 29, 1969, Ser. No. 820,051
Int. Cl. F16h *27/02*
U.S. Cl. 74—142 13 Claims



An actuating mechanism is disclosed which includes a cam member having two differently shaped cam surfaces for moving a spring loaded actuating member along a path determined by the shape of the cam surfaces. As the actuating member moves along its path, it engages and advances a driven member. The cam surfaces are shaped and positioned relative to the actuating member such that a minimal amount of force and load is transmitted to the cam member by the actuating member.

3,572,145
VARIABLE SPEED MECHANISM
Claus L. Sporck, Traverse City, Mich., assignor to Hitco, Gardena, Calif.
Filed Oct. 8, 1969, Ser. No. 864,760
Int. Cl. F16h *15/42, 55/52*
U.S. Cl. 74—192 6 Claims



Mechanism for changing the speed of rotation of an output shaft relative to an input shaft in which a pair of torque transmitting rings are mounted on a carriage and interengaged for rotation about fixed axes, one ring being in frictional contact with an expansible pulley on the input shaft and the other ring being in frictional contact with an expansible pulley on the output shaft, the change in speed being obtained by that carriage is shiftable to move the rings radially of the pulleys to shift the points of contact with respect to the centers of rotation of the pulleys.

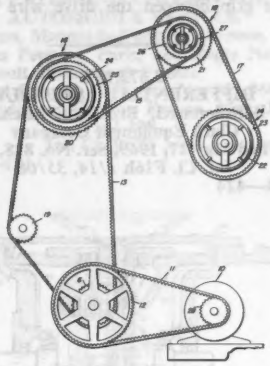
3,572,146
APPARATUS FOR USE IN SIZING CONE STEEL TUBES
Teiichi Ohtsuki and Toshiyuki Ono, Tokyo, and Yoshiaki Ono, Fujisawa-shi, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan
Filed July 18, 1968, Ser. No. 745,754
Claims priority, application Japan, July 21, 1967, 42/46,578
Int. Cl. B21b *1/00, 17/00*
U.S. Cl. 72—199 1 Claim

Apparatus for use in shaping conical steel tubing including a roll caliber having a hyperbolic curvature on the rolling surface thereof which contacts the tubing.

3,572,147
DUAL DIRECT TIMING BELT FEED ROLL DRIVE
David Noel Obenshain, Luke, Md., assignor to Westvaco Corporation, New York, N.Y.
Filed July 11, 1969, Ser. No. 840,909
Int. Cl. F16h *9/24*
U.S. Cl. 74—219 11 Claims

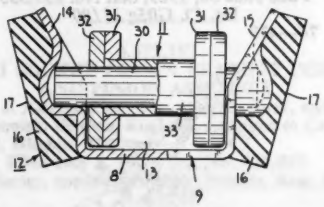
A variable ratio drive mechanism is presented which employs three exchangeable timing gears and a fixed tim-

ing gear driven by two fixed length timing belts. A pressure actuated pulley assembly is provided on the drive end of each timing gear to enable the exchangeable timing gears to be readily removed in order to change the



drive ratio, and, an adjustable parallel arms mounting means is provided for one of the exchangeable timing gears drives to adjust the tension in the timing belts when different timing gears are installed.

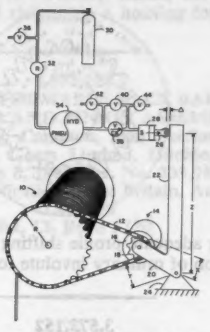
3,572,148
V-BELT
Maurice E. Hebert, 2069 Chapdelaine, Ste-Foy, Quebec, Canada
Filed June 10, 1969, Ser. No. 831,855
Claims priority, application Canada, May 2, 1969, 50,382
Int. Cl. F16g *5/18*
U.S. Cl. 74—236 **10 Claims**



A V-belt comprising a metallic chain having inner and outer links interlocked by a plurality of pivot pins, each of the pins extending beyond the sides of the chain to removably secure between its opposed ends in an associated friction member having outer friction surfaces.

3,572,149
DRIVE MECHANISM
Robert W. Cain, Dallas, and Richard H. Sliger, Richardson, Tex., assignors to Collins Radio Company, Dallas, Tex.
Filed May 19, 1969, Ser. No. 825,881
Int. Cl. F16h *7/14*
U.S. Cl. 74—242.15 **1 Claim**

A motor means is mounted on the short arm of a two armed lever. The motor means is connected to a driven means by an endless chain. The long arm of the lever is loaded by a hydraulic cylinder means whereby tension



in the chain is maintained, and backlash is kept at a minimum.

3,572,150
MOTION TRANSMITTING DEVICES
Francois Durand, 108 Boulevard Carnot, Le Vesinet, Yvelines, France
Filed May 15, 1969, Ser. No. 824,809
Claims priority, application France, May 21, 1968, 152,616
The portion of the term of the patent subsequent to Aug. 19, 1986, has been disclaimed
Int. Cl. F16h *57/00*
U.S. Cl. 74—410 **4 Claims**

A device designed for driving a toothed relatively large gear or annulus by means of a toothed pinion mounted in a support independent of the fixed structure carrying said gear or annulus. This support comprises only a roller engaging a track formed on the toothed gear or annulus, concentrically to the teeth thereof, said roller having its axis disposed in the plane comprising the axis of the driving pinion and the axis of the driven gear or annulus. A retaining rod connects this support to a single fixed point. This rod is pivoted to said point by means of universal joint, but it is pivoted to the pinion support by means of a pin of which the axis forms a certain angle with respect to the theoretical axis of said rod.

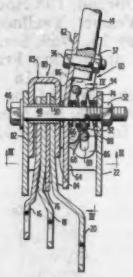
3,572,151
PROFILE SHIFTED INVOLUTE INTERNAL GEAR APPARATUS HAVING NO DIFFERENCE IN NUMBER OF TEETH BETWEEN INTERNAL GEAR AND PINION
Muneharu Morozumi, 293–1 Aza Kitanaka, Oaza Kurita, and Koro Yaezima, 1699–2 Wakazato Minamiichi, both of Nagano-shi, Nagano-ken, Japan
Filed Oct. 8, 1969, Ser. No. 864,827
Claims priority, application Japan, Oct. 12, 1968, 43/74,447
Int. Cl. F16h *1/06, 55/06*
U.S. Cl. 74—413 **1 Claim**

An internal gearing comprises an internal gear and a pinion having no difference in number of teeth and ar-

ranged in intermeshing engagement with an appropriate center distance and with a contact ratio of greater than 1,

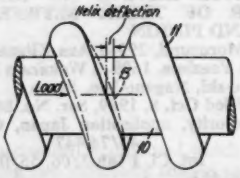
by providing adequate profile shifting to the internal gear and the pinion of ordinary involute tooth profile.

3,572,152
GEAR SHIFT MECHANISM
Max R. C. Bruhn, Jr., and James Vander Jagt, Jr., Spring Lake, Mich., assignors to Grand Haven Stamped Products, Grand Haven, Mich.
Filed Feb. 10, 1969, Ser. No. 797,860
Int. Cl. F16h *57/06*
U.S. Cl. 74—476 **8 Claims**



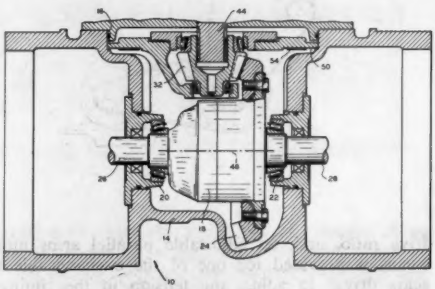
A gear shifting mechanism having a housing, forward and reverse gear actuating levers pivotably mounted within the housing, and a selector which is mounted within the housing for pivotable movement about two mutually perpendicular axes. A lever engaging means on the selector has arms which extend along the levers and inwardly on either side of the gear actuating levers. The selector is biased away from the reverse gear actuating lever by a cam and a biased cam follower. A second biasing means urges the selector to a position so as to engage the forward lever farthest away from the reverse actuating lever.

3,572,153
FLEXIBLE MECHANICAL TRANSMISSION CABLES
Ernest Baker Dove, Basildon, Essex, England, assignor to Teleflex Products Limited, Basildon, Essex, England
Filed July 17, 1969, Ser. No. 842,492
Claims priority, application Great Britain, Aug. 9, 1968, 38,134/68
Int. Cl. F16h *1/04*; B21d *53/28*
U.S. Cl. 74—422 **3 Claims**



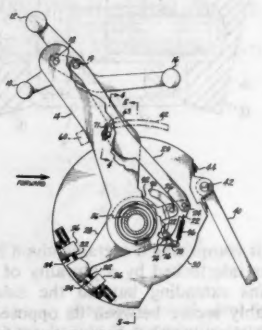
In a flexible mechanical transmission cable of the type having a multi-wire core and a drive wire applied in an open helix around the core, the cross-section of the drive wire, which has hitherto been circular, is now made of near involute form. The base of this near involute cross-section, which is contiguous with the cable core, is formed with a concavity or convexity such as to cause one or more portions of said base to bed into the core and thereby enhance the grip between the drive wire and the core under load.

3,572,154
DIFFERENTIAL ASSEMBLY
Gerald P. Bartolomucci, Brooklyn, Mich., assignor to Clark Equipment Company
Filed May 27, 1969, Ser. No. 828,181
Int. Cl. F16h *1/14, 35/08*
U.S. Cl. 74—424 **5 Claims**



A motor and differential assembly combination in which the motor shaft is separable from the differential input gear. The input gear is journaled in a support which is connected to the differential housing and positions the input gear for proper mesh with the differential ring gear.

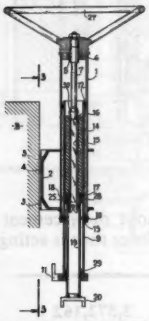
3,572,155
INTERLOCK MECHANISM
Geoffrey M. Banks, Bellevue, Wash., assignor to The Boeing Company, Seatttle, Wash.
Filed June 30, 1969, Ser. No. 837,535
Int. Cl. G05g *11/00*
U.S. Cl. 74—479 **2 Claims**



A control system for interlocking either of two input levers to an output member. The preferred embodiment involves an aircraft pilot's forward and reverse thrust throttle control levers wherein the reverse thrust lever is pivotally carried by the forward thrust lever. A rotatable pawl member is used to drivingly interconnect the output member with the forward thrust lever in a first rotatable position, and to drivingly interconnect the reverse thrust lever with the output member when the pawl member is in a second position. Positioning of the pawl member is

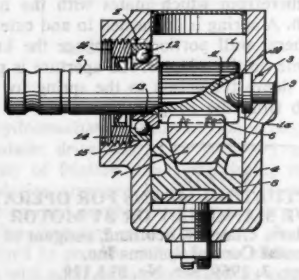
accomplished by movement of the reverse thrust lever. The interconnect pawl is self-locking for load transfer in either direction during forward thrust operation.

3,572,156
SAFETY STEERING COLUMN FOR AN AUTOMOBILE VEHICLE
Michel Grançon, Marnes-la-Coquette, France, assignor to Automobiles Peugeot, Paris, and Regie Nationale des Usines Renault, Billancourt, France
Filed Feb. 25, 1969, Ser. No. 801,960
Claims priority, application France, Mar. 20, 1968, 144,499
Int. Cl. B62d 1/18
U.S. Cl. 74—492 10 Claims



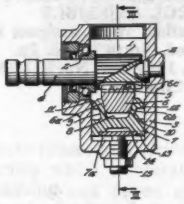
Safety steering column structure for a vehicle. The column structure comprises a steering shaft carrying the steering wheel and slidably keyed relative to an element which bears against the body of the vehicle. The shaft is connected to rotate with the steering mechanism. A projection on the shaft is adapted to force a passage through energy absorbing and dissipating material which does not restore the energy when a thrust on the shaft results in a relative displacement between the projection and the material. The projection is in the normal steering position, located a short distance from an entrance in the material.

3,572,157
PIN AND SOCKET PINION BEARING FOR RACK AND PINION ASSEMBLY
Frederick J. Adams, Campton, near Shefford, and Ronald S. Goldsmith, Hitchin, England, assignors to Cam Gears Limited, Hitchin, England
Filed July 8, 1969, Ser. No. 839,882
Claims priority, application Great Britain, Aug. 30, 1968, 41,435/68
Int. Cl. B62d 1/20
U.S. Cl. 74—498 8 Claims



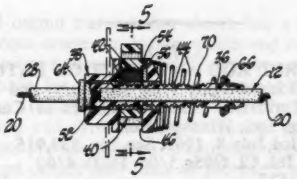
An inexpensive pinion mounting for rack and pinion assemblies useful in automotive steering gear having cooperating socket and pin or spigot parts providing radial and thrust bearing surfaces supporting a free end of the pinion and coacting with an adjustable anti-friction radial and thrust bearing to rotatably mount the pinion and hold it against axial shifting in a housing for the assembly.

3,572,158
RESILIENTLY DEFORMABLE RACK BAR SUPPORT FOR RACK AND PINION ASSEMBLY
Frederick J. Adams, Campton, near Shefford, England, assignor to Cam Gears Limited, Hitchin, England
Filed July 8, 1969, Ser. No. 839,957
Claims priority, application Great Britain, Aug. 30, 1968, 41,436/68
Int. Cl. B62d 1/20
U.S. Cl. 74—498 5 Claims



A rack and pinion assembly for automotive steering gear having a carrier providing an interference fit slidable support for the rack bar holding the rack teeth in meshed engagement with the pinion teeth and preventing lateral displacement of the bar. The bar preferably has a wedge-shaped transverse cross-section, and the carrier preferably has a wedge-shaped recess receiving the rack bar. The carrier is adjustably mounted in the assembly housing to force the rack bar deeper into the recess, and sidewall portions of the carrier are caused to be displaced and compressed between the rack bar and the housing, providing support of the rack bar against transverse movement in the general direction of the pinion axis.

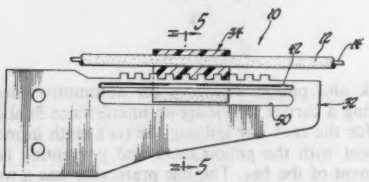
3,572,159
MOTION TRANSMITTING REMOTE CONTROL ASSEMBLY
August E. Tschanz, Dryden, Mich., assignor to Teleflex Incorporated, North Wales, Pa.
Filed June 12, 1969, Ser. No. 832,760
Int. Cl. F16c 1/10
U.S. Cl. 74—501 12 Claims



A motion transmitting remote control assembly including a conduit movably supporting a motion transmitting core element. A fitting is disposed about the conduit adjacent one end for attaching the conduit to the support structure. An elongated circular adjustment means having threads or teeth thereabout is attached to the conduit adjacent the other end and extends through a

support means or member adapted for attachment to a support structure. A locking member is supported in a passageway extending through the support member transversely to the axis of the conduit and has a first circular bore therethrough with teeth thereabout and a second larger circular bore therethrough so that the locking member may be moved between a first position wherein the adjustment means may be moved longitudinally through the support member and a second position wherein the teeth in the small circular bore engage the teeth on the adjustment member to prevent longitudinal movement of the adjustment member. A biasing means or spring reacts between the adjustment member and the support member to urge relative movement therebetween.

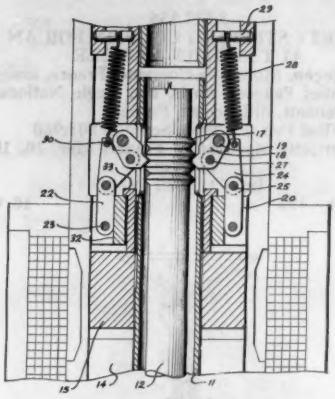
3,572,160
MOTION TRANSMITTING REMOTE CONTROL ASSEMBLY
Peter Anten Stahr, Pontiac, Mich., assignor to Teleflex Incorporated, North Wales, Pa.
Filed June 12, 1969, Ser. No. 832,709
Int. Cl. F16c *1/10*
U.S. Cl. 74—501 **14 Claims**



A motion transmitting remote control assembly including a conduit movably supporting a motion transmitting core element. A fitting is disposed about the conduit adjacent one end for attaching the conduit to a support structure. A plate-like bracket having teeth therealong is disposed adjacent the opposite end of the conduit and is adapted to be connected to a support structure. An adjustment means comprising an elongated member of organic polymeric material molded about the conduit includes a first plurality of teeth with arms extending from opposite extremities thereof for coacting with a groove in the plate to maintain the teeth in the adjustment means in spaced relationship to the teeth along the periphery of the plate whereby the adjustment means may be moved along the plate. The arms also coact with a slot in the plate so that the adjustment means may be snapped into position with the teeth thereof engaging the teeth of the plate to prevent movement of the adjustment means along the plate.

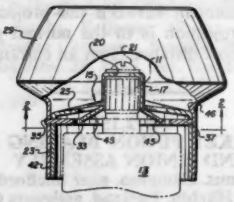
3,572,161
CONTROL ROD ANTIEJECTION LATCH
Harold V. Lichtenberger, West Simsbury, and Louis A. Bertone, Tariffville, Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.
Filed July 8, 1969, Ser. No. 839,915
Int. Cl. G05g *5/06*; H02k *4/00*
U.S. Cl. 74—527 **10 Claims**

A nuclear reactor control rod antiejection latch for use with magnetic jacking type control rod drives and having a pawl which rachets to allow insertion of the control rod, but which prevents withdrawal unless the control rod life coil is energized. A pivotally mounted locking pawl normally engages the control rod and is positively disengaged when an unlocking slug is drawn down by the lifting coil. A connecting link is pivotally attached to both the pawl and a link on the slug. The connecting link has a spring force exerted upwardly on it. The location of the pivoted connections and the spring force is such that ratcheting of



the pawl occurs without displacement of the slug and against a lesser spring force than is acting on the slug.

3,572,162
PLUMBING HANDLE KNOB COMBINATION
William F. Gresham, San Clemente, and George R. Stucka, Arcadia, Calif., assignors to VSI Corporation
Filed Apr. 1, 1969, Ser. No. 812,972
Int. Cl. G05g *1/10*
U.S. Cl. 74—553 **15 Claims**

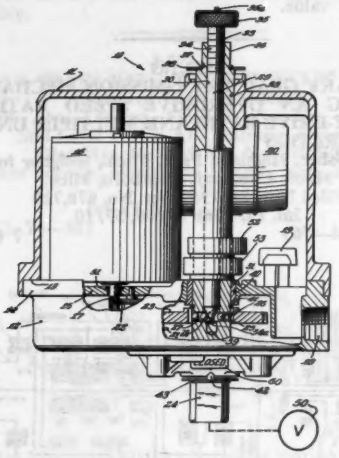


A valve control knob is provided with an adapter which has an inner sleeve portion that meshes with a splined valve stem. The inner sleeve portion has an enlarged peripheral wall section connected there to and spaced radially outward therefrom which mates with the neck of the control knob. A spring is connected to and extends through the peripheral wall portion to engage the knob sleeve to retain same on the adapter. An aperture is provided in the knob sleeve for access to the spring for removal of the knob from the adapter.

3,572,163
SELECTIVE ACTUATING MEANS FOR OPERATING A VALVE MANUALLY OR BY MOTOR
Malcolm D. Clark, Glasgow, Scotland, assignor to Raymond Control Systems Inc.
Filed Apr. 3, 1969, Ser. No. 813,119
Int. Cl. F16h *35/00*; F16d *19/00*
U.S. Cl. 74—625 **10 Claims**

Valve actuating apparatus which is normally operated by motor may be operated manually by disengaging the

output of the motor from the valve and engaging the valve with a manually rotatable shaft. One embodiment of the invention utilizes a gear having a splined hub and a plurality of spheres which are positionable into and out of the splined hub to effect mechanical coupling between the motor and the associated valve, while a second



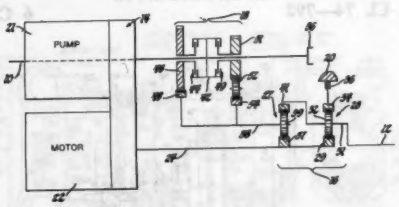
embodiment employs a lever arrangement for axial displacement of the driving pinion of the motor from the gear train driven thereby to effect disengagement of the motor, the lever arrangement being actuated by linear displacement of a manually rotatable shaft which is also employed for manual operation of the valve.

3,572,164

HYDROMECHANICAL TRANSMISSION

Marion D. Smith, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 19, 1969, Ser. No. 859,349
Int. Cl. F16h *47/04*
U.S. Cl. 74—687 **7 Claims**



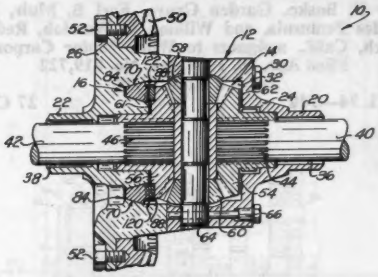
A hydromechanical transmission having a variable ratio hydrostatic drive unit, two planetary gear sets and a plurality of friction drive establishing devices with one such device arranged in a simple direction maintaining gear train and another such device arranged in a simple direction reversing gear train and all the components combined to provide at least three different speed range drives with each drive established by engagement of only one friction drive establishing device and each such device speed synchronized for its engagement at a predetermined transmission input-output speed ratio.

3,572,165

CLUTCH ACTUATOR FOR DIFFERENTIAL

Daniel W. Roper, Rochester, Mich., assignor to Eaton Yale & Towne Inc., Cleveland, Ohio

Filed Mar. 25, 1969, Ser. No. 810,206
Int. Cl. F16h *1/44*; F16d *13/04*
U.S. Cl. 74—711 **3 Claims**



This disclosure relates to a drive mechanism including a clutch assembly which is operated by an actuator to interconnect driving and driven members when a predetermined speed of relative rotation is present between the driving and driven members. In the operated condition, the clutch assembly retards the relative rotation between the driving and driven members. The clutch assembly includes an annular, generally wedge shaped clutch element which is mounted for rotation with one of the driving and driven members. Upon operation of the actuator, a cam element presses surfaces on the clutch element axially against complemental clutch surfaces mounted for rotation with the other of the driving and driven members to thereby retard relative rotation between the members.

3,572,166

DUAL OUTPUT TRANSMISSION

Sidney A. Rains, Speedway, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed May 14, 1969, Ser. No. 824,398
Int. Cl. F16h *37/06*
U.S. Cl. 74—720.5 **28 Claims**

Fig.1	Fig.1a	Fig.1b

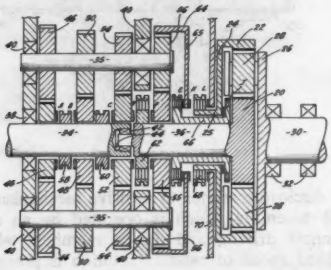
The dual output transmission shown has a range unit having a torque converter, lockup clutch and range multiratio gear unit and an output unit having two output multiratio gear units for driving two steer and vehicle brakes for retarding a dual output shaft either equally or selectively for driving and drive steering a tracked vehicle. The drive controls provide manual selection of drive ratios in the range and output gear units to provide a plurality of overall drive ratios. The steer control controls the output unit to provide drive brake steering, geared steering and pivot steering. The steer type control, i.e. land or water overcontrols the drive and steer controls to provide two overall drive ratio programs and two steering programs having different types of steering, one having geared steering and drive brake steering and the other having geared steering and pivot steering. The steer type control also over-controls the downshift inhibitor of the drive controls

to reduce the speed at which downshifts are inhibited when the steer program includes pivot steering. The drive controls provide a positive neutral and engage the lockup clutch for a positive power take off drive in neutral.

3,572,167
TRANSMISSION COMBINING GEARSET WITH PLANETARY GEARING

Walter F. Bosko, Garden Grove, Earl B. Muir, Palos Verdes Peninsula, and William E. Weseloh, Redondo Beach, Calif., assignors to White Motor Corporation

Filed Apr. 28, 1969, Ser. No. 819,722
Int. Cl. F16h *37/00*
U.S. Cl. 74—740 **27 Claims**

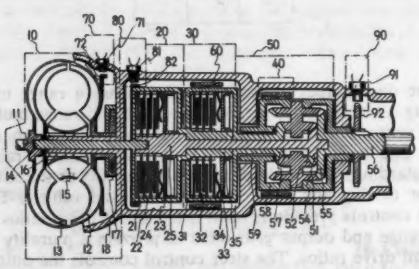


The transmission incorporates a first countershaft means together with a second countershaft means and combines a 3-speed main gear box with a 2-speed splitter and with planetary gearing to provide eighteen ideally spaced forward speeds and six reverse speeds with some of the gears used for transferring power in opposite directions selectively.

3,572,168
AUTOMATIC TRANSMISSIONS

Takeaki Shirai, Nagoya-shi, Shigeru Sakakibara, Okada, Masaaki Noguchi, Nagoya-shi, and Masaharu Sumiyoshi, Toyota-shi, Japan; said Shirai assignor to Nippon Denso Kabushiki Kaisha and said Sakakibara, Noguchi, and Sumiyoshi assignors to Toyota Jidosha Kogyo Kabushiki Kaisha

Filed Sept. 5, 1969, Ser. No. 855,606
Claims priority, application Japan, Sept. 9, 1968, 43/64,809
Int. Cl. F16h *5/42*
U.S. Cl. 74—752 **10 Claims**

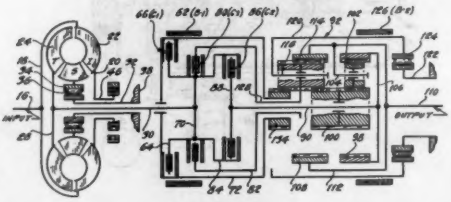


The present invention relates to a system including computer activated signals for controlling the activation in a vehicle of an automatic transmission incorporating a hydraulic torque converter, a gear transmission unit and friction engaging means for selecting the appropriate gear of the gear transmission unit which is to be activated by fluid under pressure, characterized by the utilization of a slip ratio computing means for generating an electric output signal when the ratio of revolving velocity of the output shaft of the vehicle engine (input shaft of the hydraulic torque converter) to the revolving velocity of the output shaft of the torque converter or the power driven shaft of the gear unit reaches or is within a predetermined value.

3,572,169
PLANETARY GEAR TRANSMISSION MECHANISM HAVING AN OVERDRIVE SPEED RATIO, A DIRECT-DRIVE RATIO AND MULTIPLE UNDER-DRIVE RATIOS

Alan R. Fisher, Highland Park, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 21, 1969, Ser. No. 878,720
Int. Cl. F16h *47/08, 57/10*
U.S. Cl. 74—763 **7 Claims**

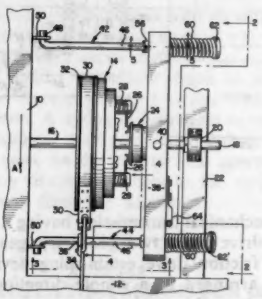


A planetary gear system having compound planetary gearing including two simple planetary gear units capable of establishing two under-drive ratios, an overdrive planetary gear unit including gear elements that are common to one of the simple planetary gear units, and a simplified clutch-and-brake system for controlling the relative motion of the elements of the gear units to establish the forward drive ratios as well as a reverse speed ratio.

3,572,170
CLUTCH-BRAKE OPERATOR FOR FORWARD-REVERSE PLANET GEARS

Donald K. Tashiro, Hamilton, Ontario, Canada, assignor to International Harvester Company, Chicago, Ill.

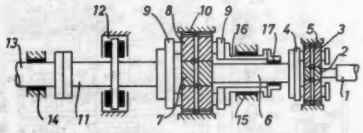
Filed Oct. 1, 1969, Ser. No. 862,854
Int. Cl. F16d *67/02*
U.S. Cl. 74—792 **6 Claims**



A control system for the conventional planetary gear transmission of a self-propelled agricultural vehicle wherein the clutch and brake assemblies of the transmission are operable to incur forward-neutral-reverse drive in

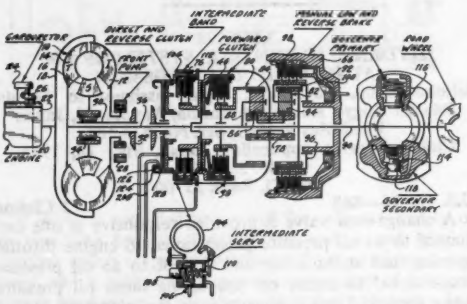
response to movement of a control lever accessible to the operator. A control member is arranged to move axially in response to rotation thereof about the power input shaft to disengage the clutch assembly and thus incur neutral drive. Continued rotation of the control member actuates the brake assembly to incur reverse drive without further significant axial movement of the control member, thereby preventing overloading of the clutch assembly.

3,572,171
GEAR TRAIN WITH TWO EPICYCLIC GEARS CONNECTED IN SERIES
Per-Erik Arne Larsson, Finspong, Sweden, assignor to Stal-Laval Turbin AB, Finspong, Sweden
Filed Mar. 26, 1969, Ser. No. 810,520
Claims priority, application Sweden, Apr. 18, 1968, 5,161/68
Int. Cl. F16h *1/46, 1/48*
U.S. Cl. 74—801 **1 Claim**



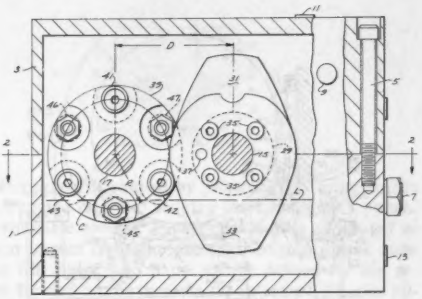
A gear train particularly adapted for marine propulsion machinery and wherein said train is in two stages of epicyclic gearing connected in series. The first stage connects by a shaft to the sun wheel of the second stage. The second stage has a planet carrier supported by a journal bearing located between the two gearing stages, said bearing being disposed around the shaft that bears the sun wheel of the second stage. Another bearing encircles said shaft, the latter bearing being located between the journal bearing and the gearing that constitutes the first stage.

3,572,172
MULTIPLE RATIO TRANSMISSION WITH SPEED SENSITIVE SHIFT TIMING CONTROLS
Po-lung Liang, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Feb. 24, 1969, Ser. No. 801,591
Int. Cl. B60k *21/10;* **F16h** *5/42*
U.S. Cl. 74—864 **13 Claims**



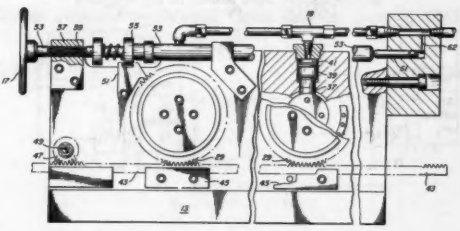
A multiple ratio planetary gear system wherein the intermediate ratio reaction element of the gear system is caused to rotate as a torque delivery member during low speed ratio operation and wherein automatic ratio changes are achieved by a valve system that senses the speed of that element as a friction brake is applied to the reaction element when the speed of the element approaches zero.

3,572,173
INDEXING DRIVE
Duane W. Woltjen, Manchester, Mo., assignor to UMC Industries, Inc., St. Louis, Mo.
Filed Apr. 16, 1969, Ser. No. 816,494
Int. Cl. B23q *17/04*
U.S. Cl. 74—815 **5 Claims**



Driving and driven shafts are supported in bearings which are permanently spaced apart at a definitely fixed center distance. On the driven shaft is a first support in the form of a flange for a circle of cam-follower rollers. On the drive shaft is a second support in the form of a flange for a cam means which drive the follower rollers around said circle. Each roller is borne upon a stud which extends through a flanged bushing. Each bushing closely but rotatably and removably fits into a hole in said first support and itself has an eccentric hole therethrough. Each stud is located in one of these eccentric holes. Each stud also has a stop at one end for engagement with the flange of the bushing, and is threaded on its end opposite to receive a draw nut reacting against said first support for clamping the flange of the bushing thereto, thereby to hold the bushing in any selected angular position on the support. By loosening the nut the bushing is released for rotary adjustment of the position of the center line of the roller which it supports, whereby the radii of the centers of any or all of the rollers may be changed. Each and every bushing, stud or roller, if damaged, is replaceable in its support, the support being protected against damage so that its replacement is not necessary in such an event.

3,572,174
MULTIPLE WORK HOLDING INDEXING FIXTURE
Charles M. Lynn, 3447 N. 53rd St., Phoenix, Ariz. 85018
Filed Mar. 24, 1969, Ser. No. 809,545
Int. Cl. B23b *29/24;* **F16h** *57/00*
U.S. Cl. 74—822 **4 Claims**

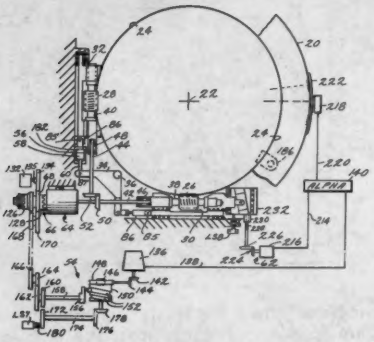


A multiple work holding indexing fixture is provided which can angularly orient a plurality of workpieces simultaneously for supporting and positioning the workpieces relative to a tool member for performing an operation thereon.

3,572,175
INDEXING MECHANISM

Thomas A. Deprez, Rochester, N.Y., assignor to The Gleason Works, Rochester, N.Y.

Filed Mar. 3, 1969, Ser. No. 803,752
Int. Cl. B23q 17/06
U.S. Cl. 74—825 14 Claims



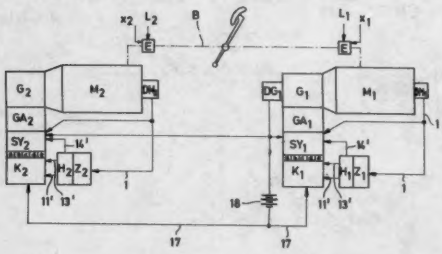
An electro-optical system is used for precisely controlling the position of a rotary member during intermittent indexing movements thereof. A linear grating or scale is arranged on the periphery of a rotary member and an electrical controller is operatively connected to a correction index motor for turning the rotary member in accordance with readings taken of the linear grating to effect corrective indexing of the rotary member after it has been initially partially indexed by a separate mechanical index drive.

There is also provided an anti-backlash feature, and an index lock-up device acting directly on the drive worm.

3,572,176
SYSTEM FOR GEAR-SHIFTING IN MOTOR VEHICLES

Benno Bildat, Obere Karlstr. 3, Erlangen, Germany

Filed Dec. 5, 1968, Ser. No. 781,393
Claims priority, application Germany, Dec. 7, 1967, P 16 55 194.3; Dec. 22, 1967, P 16 55 195.4
Int. Cl. B60k 21/00; F16d 25/00, 67/06
U.S. Cl. 74—847 28 Claims

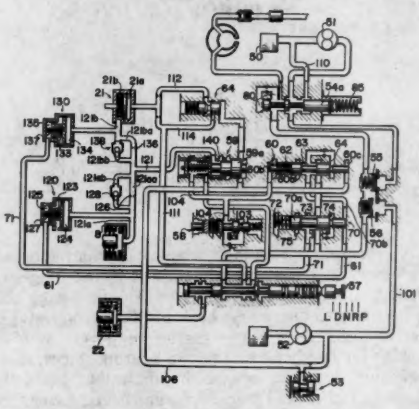


The changing of gears in either manual or automatic transmissions for motor vehicles in which the wheels or wheel groups thereof and at least two engine transmission units are separately connected, with the engines being jointly controllable by the vehicle driver as regards the fuel supply, and the arrangement being such that the flow of force between at least one of the engines and one or more associated wheels is maintained without the employment of expensive and space requiring components.

3,572,177
AUTOMATIC TRANSMISSION

Tomoo Ishihara, Tokyo, Minoru Ohya, Aichi-ken, and Shin Itoh, Tokyo, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota-shi, Aichi-ken, Japan

Filed May 6, 1969, Ser. No. 822,158
Claims priority, application Japan, June 7, 1968, 43/39,076
Int. Cl. B60k 21/06; F16d 67/04
U.S. Cl. 74—868 4 Claims



A fluid transmission wherein speed changes are carried out by a change in gearing which is accomplished by a pressure line supplying fluid pressure which acts on interlocked clutch and brake band elements. To avoid shock during the speed change, first and second accumulator arrangements are interposed in the pressure line. These accumulator arrangements include delay means whereby the release of one element is accomplished prior to the accomplishment of the engagement of the second element.

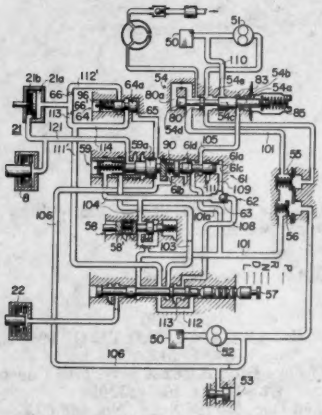
3,572,178
HYDRAULIC CONTROL SYSTEM OF AN AUTOMATIC TRANSMISSION

Seitoku Kubo, Toyota-shi, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota-shi, Japan

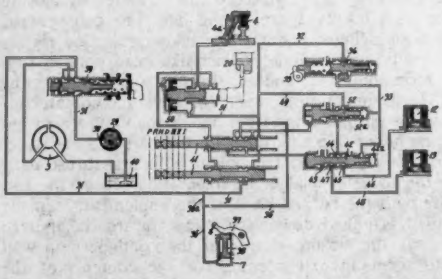
Filed May 9, 1969, Ser. No. 823,382
Claims priority, application Japan, May 18, 1968, 43/33,414
Int. Cl. B60k 23/00
U.S. Cl. 74—868 2 Claims

A change-over valve is provided responsive at one end thereof to an oil pressure proportional to engine throttle opening and at the other end thereof to an oil pressure proportional to actual car speed, the latter oil pressure being derived from a governor on the planetary output shaft. Under conditions of low car speed and high torque demand the throttle pressure is effective to move the change-over valve to the left thereby communicating the oil line supply pressure to a pressure regulator valve chamber thereby causing the pressure regulator valve to increase the oil line pressure supplied to the hydraulically operated clutches, brake bands, etc. As car speed increases, the governor pressure overcomes the throttle pressure and

moves the change-over valve back toward the right. This causes the oil line pressure to exhaust from the aforementioned regulator valve chamber thereby decreasing the oil line pressure supplied to the various hydraulically operated clutches, brake bands, etc. Operation of the manual valve from the DRIVE position to the LOW position is effective to render the change-over valve responsive to the oil line pressure rather than the throttle opening pressure.

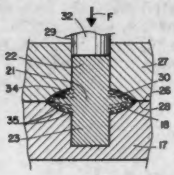


3,572,179
AUTOMATIC TRANSMISSION APPARATUS
Akira Akima, Tokyo, and Kazuyoshi Yoshida and Tomio Oguma, Saitama-ken, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 26, 1969, Ser. No. 802,602
Int. Cl. B60k *21/06*
U.S. Cl. 74—869 **8 Claims**



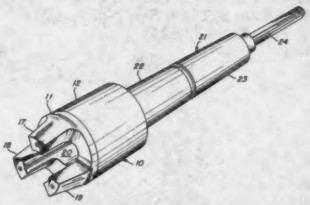
A valve is provided to control the selective supply of an operating pressure fluid to first and second friction clutches which respectively control the operation of low speed and a high speed transmission system of a speed change mechanism. The valve is displaceable between first and second positions and is subject to pressure fluid at its opposite ends, the pressure of the fluid at one end being related to engine output power and the pressure of the fluid at the other end being related to the speed of an output shaft of the transmission system. When the valve is in the first position, one clutch is activated whereas when the valve is in its second position the other clutch is activated.

3,572,180
METHOD FOR FORGING CUTTING WHEELS
Alfred E. Beaumont, 5510 Melvin Ave., Tarzana, Calif. 91356
Filed Aug. 28, 1968, Ser. No. 756,054
Int. Cl. B21k *21/00*
U.S. Cl. 76—101 **1 Claim**



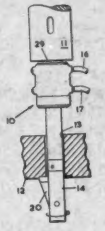
A cutter wheel is shaped by positioning a billet within a pair of mated dies and striking the billet with a punch. An intermediate zone of the billet is locally preheated so that upon impact from the punch, the intermediate zone material will bulge into a die cavity defined by die peripheries formed on the dies. As the intermediate zone billet material is forced into the die cavity, the metal grain lines are reoriented in radial directions so as to strengthen the edge to be ultimately used as a cutting edge.

3,572,181
ANGULARITY INDICATING DRILLING ATTACHMENT
Martin S. Schlegel, 1212 E. Gardenia St., Phoenix, Ariz. 85020
Filed Sept. 6, 1968, Ser. No. 758,004
Int. Cl. B23b *49/00*
U.S. Cl. 77—55 **4 Claims**



An attachment for a drilling apparatus to maintain the drill at a pre-selected angle. Indicators, responsive to contact between the drilling attachment and the workpiece, verify angular alignment.

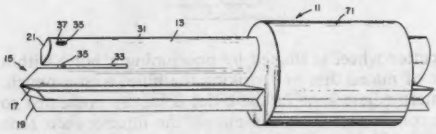
3,572,182
CUTTING TOOLS
James Stewart MacDonald, Rugby, England, assignor to The English Electric Company Limited, London, England
Filed Sept. 3, 1968, Ser. No. 756,858
Claims priority, application Great Britain, Sept. 1, 1967, 40,015/67
Int. Cl. B23b *29/03*
U.S. Cl. 77—73.5 **8 Claims**



A simple back-spot facing tool has a fluid-pressure operated actuating member which retracts the cutter into

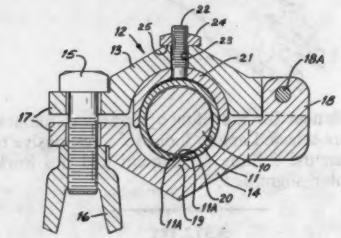
the tool body and moves it into its angle cutting position, the thrust during cutting being transferred to the tool body through the actuating member.

3,572,183
STRAIGHT DRILL
Gennaro Mellone, 3884 Shirley Ave., Lynwood, Calif. 90262
Filed June 26, 1968, Ser. No. 740,844
Int. Cl. B23b *51/00*
U.S. Cl. 77—67 5 Claims



A rotary drill for drilling holes in a workpiece whereby equal and balanced cutting pressure is applied by three separate cutting edges disposed at a cutting end of a solid elongated shank member in equally spaced angular directions around the drilling axis, each of the cutting edges being inclined and situated along the same conical rotation surface to generate adjacent annular zones of the conical surface.

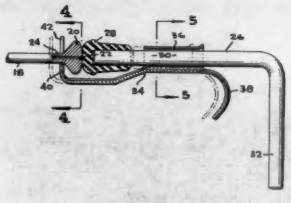
3,572,184
TOOL FOR ADJUSTING TIE RODS
George Tocci, 240 Floral Ave., Plainview, N.Y. 11803
Filed Feb. 5, 1969, Ser. No. 796,776
Int. Cl. B25b *1/00*
U.S. Cl. 81—3 8 Claims



A tool for use in freeing and rotating threaded split sleeves of the type forming part of the adjustment means of a vehicular tie rod. The tool is in the form of a split nut, the two parts of which may be readily bolted around the split sleeve and is provided with an elongated wedge which forces the lips of the sleeve apart thereby freeing the sleeve for rotation.

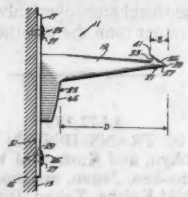
3,572,185
TOOL FOR ACTUATING PRESSURIZING PUMP OF FUEL TANK
Richard L. Compton, 2025 N. Fremont, Springfield, Mo. 65803
Filed Mar. 12, 1969, Ser. No. 806,518
Int. Cl. B25b *11/00*
U.S. Cl. 81—3 8 Claims

A hand-held tool having an L-shaped handle supporting a reciprocable fork for engagement with the base of a knob on a plunger rod employed for pressurizing a fuel tank to grasp the knob between the fork and a seal means on the end of the handle which seals a vent opening in



the knob to enable pressurization of the tank by manual reciprocation of the tool and rod.

3,572,186
FINGER TAB CAN CLOSURE OPENING PRONG MEANS
Grady Page Dillard, 16220 NW. 27th Court, Opa-Locka, Fla. 33054
Filed Dec. 15, 1969, Ser. No. 885,073
Int. Cl. B67b *7/36*
U.S. Cl. 81—3.3 7 Claims

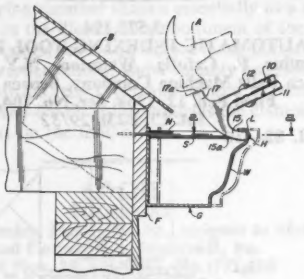


A can opening implement adapted to be stationarily mounted on existing support structure in a building for providing auxiliary can opening means for detaching the finger grip ring tab and score line demarcated closure section of a beverage can or the like. The can opening implement includes a prong-like body projecting rigidly horizontally, and includes a barb-like head portion supported on the distal end of the horizontally-projecting body. In using the implement, the beverage container is held in an upright disposition and is manipulated to engage the finger grip ring tab with the barbed head structure of the implement. The container is first thrust away from the user to engage the finger ring tab of the can closure with the barbed head of the implement, then the container is pulled downwardly and toward the user to peel away the closure section of the container top wall and to form an exit opening for the contents of the container.

3,572,187
PLIERS TOOL
Emerson Glassburn, 1412 E. Hudson St., Columbus, Ohio 43211
Filed June 11, 1969, Ser. No. 832,127
Int. Cl. B25b *7/22*
U.S. Cl. 81—5.1 5 Claims

A pliers-type tool facilitating removal of rain gutters or eavestroughs from a building structure is provided which avoids damage to the gutter as a consequence of removing a securing nail. The tool comprises a pair of jaw assemblies formed on one end of a pair of pivotally

connected handles. Each jaw assembly is relatively oriented to the other to form a striking surface readily contacted by a hammer when the opposite jaw assembly is in engagement with the gutter fastening nail.

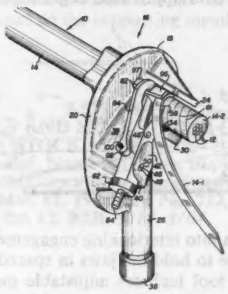


3,572,188
HIGH SPEED RATCHET WRENCH
William S. Christian, Jr., Rte. 4, Lafayette, Ala. 36862
Filed May 21, 1969, Ser. No. 826,570
Int. Cl. B25b *13/46*
U.S. Cl. 81—57.46 10 Claims

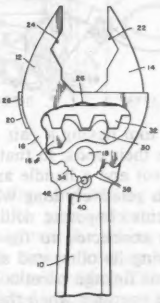
A ratchet wrench for high speed, low torque and low speed, high torque operation has a reel inside a casing rotatable on an axial shaft. A first pawl carried by the reel engages a ratchet wheel secured to the shaft to turn the same when the reel turns. A second pawl carried by the cover plate engages the ratchet wheel to turn the shaft when the casing is turned by radially-extending handles. A cable wound on the reel moves axially of the handle for fast turning the reel when a removable extension is pulled from one of the handles.

3,572,189
INSULATION JACKET SHAVING TOOL
James J. Matthews, Hicksville, N.Y.
(Landing Hill Road, East Haddam, Conn. 06423)
Filed Nov. 26, 1968, Ser. No. 778,955
Int. Cl. H02g *1/12*
U.S. Cl. 81—9.5 10 Claims

A tool is provided for shaving and stripping the impregnated outer layer from the insulating jacket of an electrical conductor cable in which the tool has a channel for receiving the insulated conductor cable, an adjustment for adapting the size of the channel to various different diameter conductor cables, an insulation shaving blade that is operable toward or away from the conductor cable to adapt to different diameters thereof, and a limiting element to limit the depth of blade penetration of the conductor cable.



3,572,190
RESILIENT SELF-ADJUSTING WRENCH
Ernest N. Oeland, Jr., West Covina, Calif., assignor to the United States of America as represented by the Secretary of the Navy
Filed Aug. 26, 1969, Ser. No. 853,019
Int. Cl. B25b *13/12*
U.S. Cl. 81—127 3 Claims

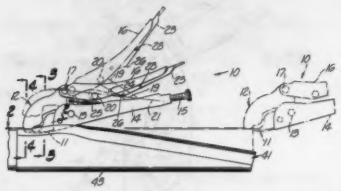


A self-adjusting wrench including a handle, a pair of jaws wherein one jaw is pivotally mounted to the upper end of the handle and the other jaw has a rack portion which is slidably mounted to the pivoted jaw, and the upper end of the handle having a pinion which meshes with the rack so as to open and close the jaws. The pivoted jaw has a body portion with an arcuate edge which has convolutions and a resilient insert is mounted in the handle adjacent these convolutions. A pin is mounted within the resilient insert and has an extension therebeyond which resiliently engages the edge of the pivoted jaw upon the convolutions so that pin action on the pivoted convolutions enables the user to preselect a spacing between the jaws and then obtain ratcheting operation when the wrench is applied to a nut.

3,572,191
SEAM CLOSING TOOL
Hans E. Bannies, Laguna Beach, Calif., assignor to Walter A. Plummer, Sherman Oaks, Calif.
Filed Apr. 29, 1968, Ser. No. 724,858
Int. Cl. B25b *7/12*
U.S. Cl. 81—367 12 Claims

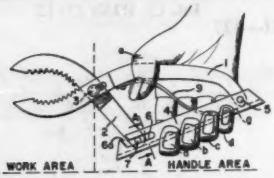
A plier-like closure tool for use in opening and closing seam-forming tape of the type having tongues and grooves

along their juxtaposed faces shaped to interlock to form a separable seam as the tongues and grooves are pressed together from the remote surfaces of their overlapped edges. The tool jaws are specially contoured to embrace and retain the overlapped tape edges inproper position for



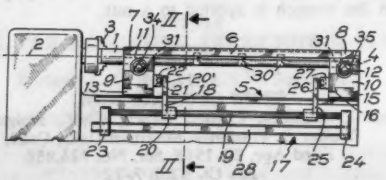
camming them into interlocking engagement and including means effective to hold the jaws in spaced-apart operating position. The tool includes adjustable means for accommodating the tool jaws to use with tapes of differing thicknesses.

3,572,192
SQUEEZE TYPE TOOLS
Stanley M. Juras, 67 Eggleston St., Uniontown, Pa. 15401
Filed May 10, 1968, Ser. No. 728,117
Int. Cl. B25b *7/12*
U.S. Cl. 81—383.5 **10 Claims**



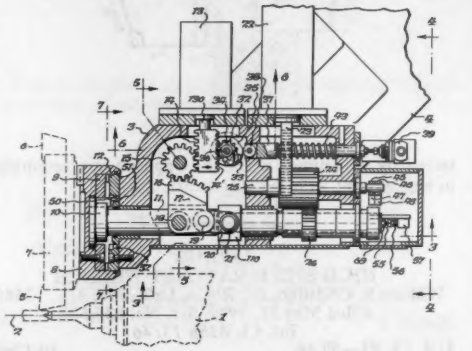
A squeeze type tool having a pair of arms pivoted at a point intermediate their ends, so that a work area lies on one side of the pivot and a handle area lies on the other. One of the arms is relatively long when compared to the other and both arms cooperate with a third arm having one end pivotally connected to the extreme end of the long arm and having its other end slidably engaged with the short arm. This linkage permits the work area to be in full view of the operator when the tool is grasped in a natural manner with the thumb uppermost on the long arm and the fingers curling in efficient sequence on the third arm.

3,572,193
DEVICE FOR MACHINING A WORKPIECE ON A LATHE BY THE SIMULTANEOUS TRANSVERSAL FEEDING OF SEVERAL TOOLS
Jules Louis Jeanneret, 13–21 Rue Henri Gelin 79, Niort, France
Filed July 15, 1968, Ser. No. 744,745
Claims priority, application France, July 21, 1967, 115,165
Int. Cl. B23b *21/00*
U.S. Cl. 82—25 **5 Claims**



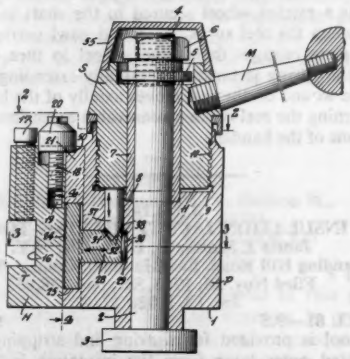
Device for mounting on an automatic copying lathe for the simultaneous transverse feeding of several tools, comprising a longitudinally movable adjustable tool carrier which is transversely movable with respect to the axis of the piece by means of a mechanical transmission.

3,572,194
AUTOMATIC INDEXING TOOL BLOCK
Constantine F. Cafolla, Waterloo, N.Y., assignor to Seneca Falls Machine Company, Seneca Falls, N.Y.
Filed Feb. 12, 1968, Ser. No. 704,878
Int. Cl. B23b *29/32*
U.S. Cl. 82—36 **8 Claims**



A clamping and index shaft is mounted for rectilinear reciprocal movement between extended and retracted positions and also for rotary movement between index positions. A tool block is mounted on the shaft for movement therewith between index position, and a coupling member is mounted on the shaft for movement therewith into and out of retracted position. Another coupling member engages the one to hold the shaft against indexing when the shaft is retracted. A motor is operable to move the shaft between extended and retracted positions, and another motor is operable to rotate the shaft by the index positions. The one motor is arranged in controlling relation to the other for indexing the shaft only upon movement out of retracted position, thereby disengaging the coupling members.

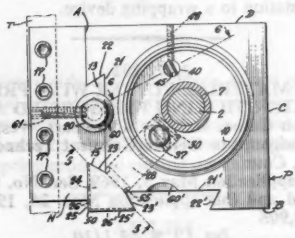
3,572,195
QUICK-CHANGE TOOLPOST
Eugene F. Gourley, Meadville, Pa., assignor to McCrosky Tool Corporation, Meadville, Pa.
Filed July 22, 1968, Ser. No. 746,529
Int. Cl. B23b *29/08*
U.S. Cl. 82—36 **12 Claims**



A toolpost adapted to be affixed to a lathe or similar machine, and embodying a clamping mechanism therein

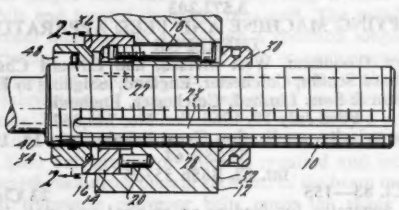
for quickly attaching and detaching a toolholder relative thereto, at a predetermined level, through the intermediary of vertically disposed complementary dovetail-shaped fittings on the toolholder and on at least one face of the toolpost, the latter of which includes a horizontally movable clamping member shaped essentially as a surface of revolution. In the illustrated embodiment of the invention, the latter comprises a disk-shaped outer portion, truncated along a vertical chord, and a suitably recessed cylindrical inner portion, the rapid and simple movement of which, in a to-and-fro direction, controls the clamping and releasing effects on the toolholder.

3,572,196
TOOLPOST
Eugene F. Gourley, Meadville, Pa., assignor to McCrosky Tool Corporation, Meadville, Pa.
Filed Nov. 20, 1968, Ser. No. 777,416
Int. Cl. B23b 29/24
U.S. Cl. 82—36 **7 Claims**



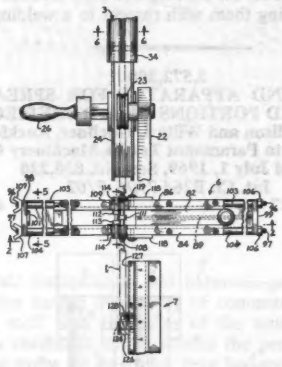
A toolpost adapted to be affixed to a lathe or similar machine, and embodying a unitary clamping mechanism therein for quickly attaching and detaching a toolholder relative thereto, at a predetermined level, through the intermediary of a vertically disposed dovetail-shaped tenon on the toolholder interfitting selectively with a complementary dovetail-shaped mortise provided on each one of two faces of the toolpost arranged at right angles to each other. The unitary clamping mechanism includes a horizontally movable member provided on its outer portion with clamping components forming intermediate parts of each of the mortises on the toolpost, which upon actuation of the cylindrical inner portion of said member along an axis bisecting the right angle of the toolpost containing the mortises, effects a locking of the toolholder to the selected face of the toolpost by a rapid and simple to-and-fro movement of a handle which controls the clamping and releasing effects on the toolholder.

3,572,197
ADJUSTABLE TOOLHOLDER
Robert M. Ortlieb, Southfield, Mich., assignor to Devlieg Machine Company, Royal Oak, Mich.
Filed Dec. 10, 1968, Ser. No. 782,654
Int. Cl. B23b 29/04
U.S. Cl. 82—36 **6 Claims**



An adjustable tool supporting structure in which a threaded tool carrying shank is located along its thread axis on a supporting member by means of an adjusting collar. The collar as well as a locking nut are threaded onto the shank. The collar engages a seat on one side of the supporting member while the locking nut bears against the opposite side thereof. A special band is used to hold the collar in a desired position on the shank when the shank is not clamped on the supporting member.

3,572,198
APPARATUS AND METHOD FOR CUTTING STOCK MATERIAL
William J. Adlaf, North Riverside, Ill., assignor to Esterline Corporation, Broadview, Ill.
Filed Mar. 11, 1968, Ser. No. 712,153
Int. Cl. B23b 5/14, 3/04
U.S. Cl. 82—47 **5 Claims**

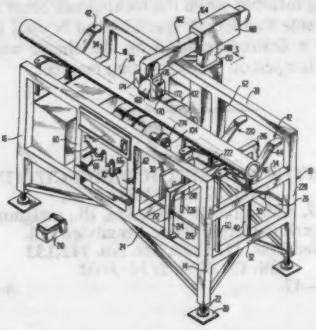


Apparatus for handling and cutting metal tubing comprises a reel upon which a coil of tubing may be placed and a device that straightens the tubing as it is withdrawn from the reel and is moved into an elongated housing that stores the straightened tubing. The tubing may then be advanced, as desired, through a fixture to cut off selected tube lengths from the supply. The housing keeps the remaining supply of tubing from being bent. The fixture supports the tubing for rotation about its longitudinal axis and includes a knife that is drawn over the tubing transversely thereof. The frictional engagement of the knife with the tubing rotates the latter and the disposition of the cutting edge of the knife is such as to increase progressively the depth of cut as the knife moves through a predetermined path.

3,572,199
PIPE FABRICATOR
Charles R. Harden, 125 Stevens Creek Road, Augusta, Ga. 30907
Filed May 28, 1969, Ser. No. 828,505
Int. Cl. B23b 3/04, 3/22
U.S. Cl. 82—101 **8 Claims**

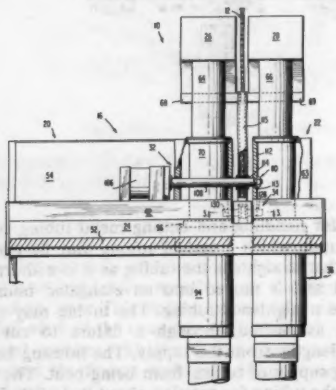
A portable assembly for handling pipe sections to perform various fabricating operations thereon. The main frame includes adjustable support rolls which cradle a pipe section and impart rotation thereto and various attachments may be mounted on the frame for performing cutting and welding operations. A carrier post adjacent the rolls is selectively driven for raising and lowering

motions and carries certain of the attachments, while a driven roll is provided with a power take-off to drive



another attachment for holding two pipe sections in alignment and rotating them with respect to a welding device.

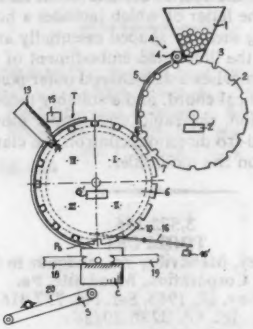
3,572,200
METHOD AND APPARATUS FOR SPREADING SEVERED PORTIONS OF A WORKPIECE
Rudolph L. Allison and Willy J. Goellner, Rockford, Ill., assignors to Paramount Textile Machinery Co.
Filed July 1, 1969, Ser. No. 838,220
Int. Cl. B26d *7/06, 7/02*
U.S. Cl. 83—27 **4 Claims**



A method and apparatus for severing a workpiece with a cutting tool returnable through the kerf or cut made thereby characterized by the movement of the severed portions away from the kerf prior to the return of the cutting tool. At least one of the severed portions is subsequently restored to its initial position to facilitate measuring. When slides are employed for separating the severed portions of the workpiece, the severed workpiece portions may be clamped to these slides from two generally opposite directions.

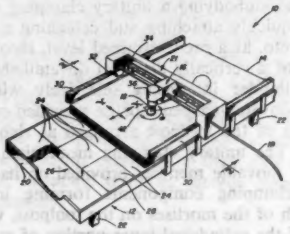
3,572,201
MACHINE FOR PRODUCING TOOTHPICKS
Soyez Roger, La Celle-sur-Loire, Nievre, France, assignor to Soyez Freres Donzy, Nievre, France
Filed Nov. 15, 1968, Ser. No. 776,164
Claims priority, application France, July 16, 1968, 159,394
Int. Cl. B26d *7/06;* B23d *21/02, 21/04*
U.S. Cl. 83—119 **23 Claims**

A machine for producing toothpicks from tubes of synthetic material comprising an automatic feeding and orienting mechanism for feeding individual tubes to a cutting device which acts to cut the point and heel of the toothpick to the required profile. An arrangement is provided



for automatically transporting each formed toothpick from the cutting station to a wrapping device.

3,572,202
SHEET MATERIAL CUTTER WITH PRESSER PLATE UTILIZING PRESSURIZED AIR
Heinz Joseph Gerber and David R. Pearl, West Hartford, Conn., assignors to Gerber Garment Technology, East Hartford, Conn.
Original application May 5, 1969, Ser. No. 821,723. Divided and this application Mar. 26, 1970, Ser. No. 22,905
Int. Cl. B26d *1/10*
U.S. Cl. 83—146 **2 Claims**

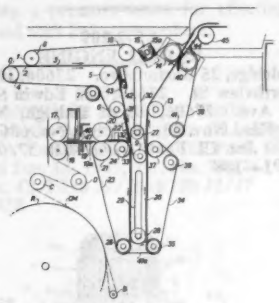


Apparatus for cutting sheet material includes a cutting table having a material supporting surface and a cutter movable in the plane of such surface and having a blade engageable with the material spread thereon to cut such material as it is moved along a desired line of cut. A presser plate or foot located adjacent the blade applies a pressing force to the material at the cutting zone and includes openings facing the material from which pressurized air is emitted to exert a greater force on the material and/or to form an air cushion between the presser foot and the material to reduce friction.

3,572,203
COPYING MACHINE AND FEED APPARATUS THEREFOR
Edward Woodham, West Mersea, and Edward Charles Richard Scoffin, Colchester, England, assignors to E. N. Mason & Sons Limited, Colchester, England
Filed July 19, 1968, Ser. No. 746,067
Claims priority, application Great Britain, July 19, 1967, 33,259/67
Int. Cl. B65h *35/06*
U.S. Cl. 83—155 **23 Claims**

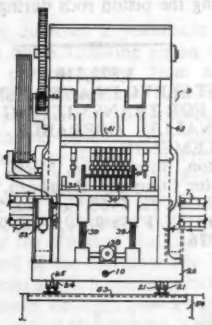
An apparatus for feeding an original and material to receive a copy thereof to copying means, comprising a severing device operative to cut off a length of the copy

material determined by the length of the original. Trip mechanism may be provided operatable by the original to initiate the drive of the copy material; to stop the feed of such material and to set the severing device in operation, and a reservoir loop of copy material may be formed



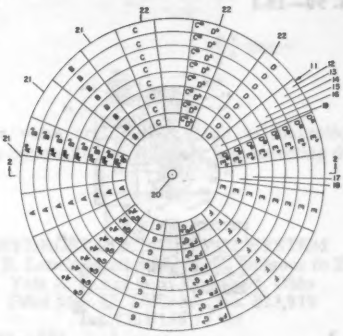
on the delivery side of the severing device or a loop of both original and copy material. The severing device preferably comprises a knife which has initial penetrating points and cutting edges which have a progressive action and has a spring produced cutting stroke.

3,572,204
HOLE PIERCING APPARATUS
John R. McConnell, 148 Woodside Ave., Ridgewood, N.J. 07450
Filed Sept. 11, 1967, Ser. No. 666,829
Int. Cl. B26d *7/06*
U.S. Cl. 83—421 **3 Claims**



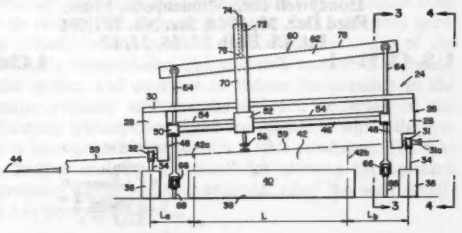
A punching apparatus is set forth herein for the simultaneous piercing of holes through the webs of structural beam shapes near each end comprising a fixed and a mobile end located dual punching unit. The mobile unit is wheel mounted on a track on a common longitudinal fabricating line for variable centre to centre spacing of the operating centres of the punching units for the punching-fabrication of beam members of variable effective lengths. The said mobile unit is pre-located by a powered threaded relocating shaft to produce in co-operation with the fixed unit groups of holes as required and indicated by length measuring dials at each end of the beam member. Dual transverse conveyor belts move the shape transversely under the operating heads of the punches, dual length-centering rams longitudinally locate the shape under the punching heads, dies on an elevating anvil raise the shape off the conveyors and selected upper located punches pierce the required holes. On retraction of the punches and dies the member is returned to the conveyors for forward progression to discharge as a completed member.

3,572,205
HARMONIC TEACHING DEVICE
Lois G. Scholfield, 2109 Tawhee Drive, Madison, Wis. 53711
Filed July 7, 1969, Ser. No. 839,295
Int. Cl. G09b *15/02*
U.S. Cl. 84—474 **3 Claims**



A music transposition and harmonic-pattern construction device having a plurality of concentric disks of decreasing radii with the notes of the musical scale produced in chromatic order around the periphery of each disk. The notes on each disk may be separated by blank spaces. In use, the operator may dial a harmonic pattern for any musical key and the device will simultaneously present the same pattern for all other musical keys.

3,572,206
CONTOUR MILLING MACHINE
Tibor Eckstein and Henry H. Johnson, Oakland, Calif., assignors to Hexcel Corporation, Dublin, Calif.
Filed Apr. 1, 1969, Ser. No. 811,928
Int. Cl. B23c *1/16, 3/02*
U.S. Cl. 90—13 **14 Claims**



A milling machine for shaping contoured airfoil cores and the like which has a rotary cutter reciprocal in a first direction and movable in a second, transverse direction in incremental steps. Spaced apart cam plates engage cam followers which operate a control and positioning device which in turn continuously adjusts the angular inclination of the rotary tool axis during each reciprocating movement of the tool to maintain the cutting plane of the tool tangent to the contoured core surface. The tool is mounted

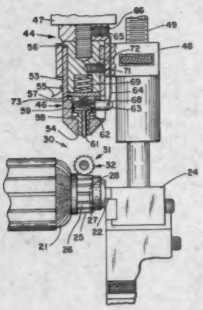
to a milling head support structure that is tapered away from the core to prevent an interference between steeply angled core surfaces and the support structure and which is further constructed to permit pivotal movement of the rotary tool axis about its cutting point through an arc of 90°.

3,572,207

APPARATUS AND METHOD FOR AUTOMATICALLY INDEXING A WORKPIECE IN A MACHINE

Robert J. Fleming, West Yarmouth, Mass., assignor to Amdek Corporation, Sudbury, Mass.

Filed Feb. 14, 1969, Ser. No. 799,222
Int. Cl. B23c 3/30; B23f 23/08; B24b 19/00
U.S. Cl. 90—15.1 **7 Claims**



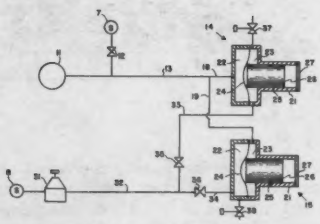
Relative movement between the tool of a machine and an electrically conductive workpiece, having at least one non-conductive area, is accomplished by a stepping motor controlled by an R.F. generator probe normally in intimate contact with the surface of the workpiece but retractable therefrom in a path normal thereto. Stepping advance continues so long as the R.F. energy is absorbed by the workpiece, but halts instantaneously and precisely when the probe senses the non-conductive area, which may be a void, slot, or insulative insertion. The workpiece is rotatable in V bearings by a flexible drive belt to yield in conformance with the tool path.

3,572,208

PNEUMATIC ANNUNCIATION SYSTEM

Richard C. Mott, Harwood Heights, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 30, 1968, Ser. No. 787,696
Int. Cl. F01b 25/26, 31/12
U.S. Cl. 91—1 **8 Claims**



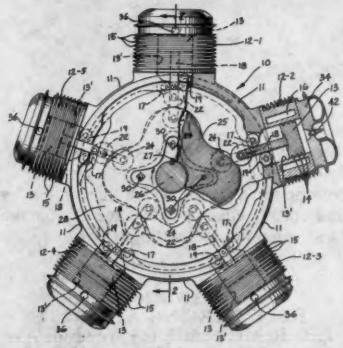
A pneumatic annunciation system that compares a thermostatic signal pressure with pre-selected high and low reference pressures and annunciates the surpassing of either reference pressure by the signal pressure. The reference pressures are derived from the output pressure of a pressure regulating valve, which also serves as a setpoint pressure. The system is aranged so that a predetermined interval is maintained between the reference pressures and the setpoint pressure when the pressure regulating valve is adjusted.

3,572,209

RADIAL ENGINE

Hal F. Aldridge, 25 Burton Ave. 27606; Hal L. Aldridge, 910 Northview St. 27610; and Edwin S. Aldridge, 23 Burton Ave. 27606, all of Raleigh, N.C.

Filed Nov. 28, 1967, Ser. No. 686,258
Int. Cl. F01b 1/06; F02b 57/08
U.S. Cl. 91—188 **4 Claims**



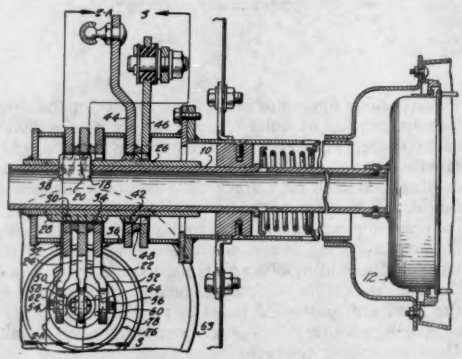
A radial type internal combustion engine having a cam drive wheel, radially disposed piston and piston rod assemblies, and separate and distinct roller bearings alternately supporting the piston rods during operation of the engine.

3,572,210

POWER BOOST SERVO IN A TRANSMISSION RATIO SELECTOR FOR TRANSMITTING FORCES FROM A PERSONALLY OPERABLE MEMBER TO DRIVEN ELEMENTS

David W. Barton, Birmingham, Mich., assignor to Ford Motor Company, Dearborn, Mich.

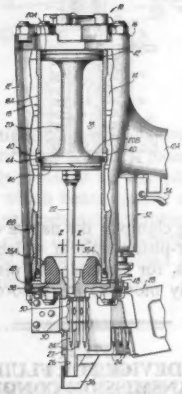
Filed Oct. 22, 1968, Ser. No. 769,583
Int. Cl. F15b 9/10; F16j 9/00
U.S. Cl. 91—376 **6 Claims**



A power boost mechanism for use in a transmission ratio selector comprising a personally operable shaft

adapted for rotary and translatory movement by an operator, a pair of shift linkage members, clutch means for connecting selectively the personally operable shaft to each of the shift linkage members, a pressure operated servo piston connected mechanically to said shaft and valve means responsive to twisting movement of the shaft by the operator to distribute actuating fluid pressure to said servo thereby applying a pressure assist for effecting shifting movement of said shift linkage members.

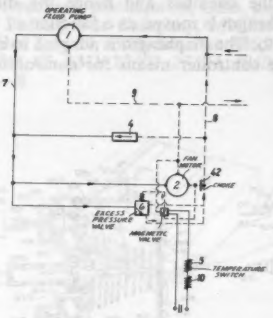
3,572,211
FASTENER DRIVING TOOL
Richard H. Doyle, Mount Prospect, Ill., assignor to Fastener Corporation, Franklin Park, Ill.
Filed Jan. 13, 1969, Ser. No. 790,761
Int. Cl. F01b *31/10*; F15b *15/17*
U.S. Cl. 91—417 **6 Claims**



The application discloses a pneumatic fastener driving tool having a blade actuating piston with an upper, greater diameter portion spaced from a lower, lesser diameter portion by a recessed area forming an air return space continuously supplied with compressed air to hold the piston in a normal position. The different diameter portions of the piston are slidable in corresponding diameter portions of a cylinder, and a resilient O-ring on the upper end of the lesser diameter portion of the cylinder seals against the lesser diameter piston portion in the normal position of the piston to seal the air return space from the lower end of the cylinder. The lesser diameter piston portion carries a nylon bearing which guides piston movement but permits air from the return space to blow by into the lower end of the cylinder when the piston is moved out of its normal position during a driving and return stroke.

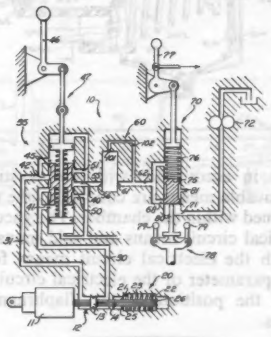
3,572,212
CONTROL DEVICE FOR HYDRAULIC VENTILATOR DRIVES
Franz Pigisch, Schockingen, Germany, assignor to Firma Suddeutsche Kuhlerfabrik Fr. Behr, Stuttgart-Feuerbach, Germany
Filed Mar. 12, 1969, Ser. No. 806,463
Claims priority, application Germany, Mar. 13, 1968, P 16 78 603.1
Int. Cl. F15b *21/04*
U.S. Cl. 91—419 **9 Claims**

A control means for hydraulic ventilator drives especially for regulating the temperature of the cooling fluid by means of a controlled ventilator regulator and an excess pressure valve and means for automatically changing the pressure at which the excess valve responds to the back pressure in the operating fluid circuit that depends on the speed or rate of travel, which means is primarily intended for ventilators in branch circuits and



includes a valve arrangement, such as magnetic valve means for optionally connecting or disconnecting the back pressure.

3,572,213
HYDROSTATIC CONTROL SYSTEM
Robert B. Lauck, Southfield, Mich., assignor to Eaton Yale & Towne Inc., Cleveland, Ohio
Filed May 12, 1969, Ser. No. 823,819
Int. Cl. F15b *11/08*
U.S. Cl. 91—444 **5 Claims**

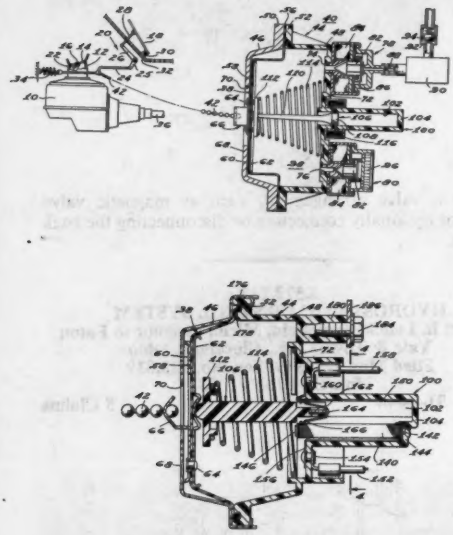


A hydraulic control system for a vehicle includes a master control valve which is operated by a manual control to control the flow of hydraulic fluid to a fluid pressure cylinder which operates to control the swash of the hydrostatic transmission. An anti-stall control is included in the system and operates to reduce the pressure in the pressure cylinder and thereby effect a de-swash of the hydrostatic transmission when the vehicle in which the system is incorporated encounters a stall condition. The system further includes a control for slowing the increase in pressure in the pressure cylinder after the stall condition has been alleviated.

3,572,214
VACUUM MOTOR ADAPTED FOR USE IN A VEHICLE SPEED CONTROL MECHANISM
Gary F. Woodward, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Dec. 4, 1968, Ser. No. 781,170
Int. Cl. F15b *9/03, 9/09, 13/044*
U.S. Cl. 91—457 **7 Claims**

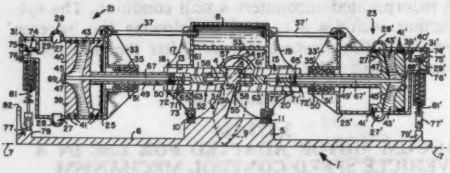
A vacuum motor which is especially adapted for use in a speed control mechanism for an automotive vehicle in

which a flexible diaphragm is positioned in the housing of the motor and cooperates with the housing to form a chamber. Means are provided communicating with the chamber and the flexible diaphragm for applying a varying pressure to the chamber and hence the diaphragm so that the diaphragm is moved as a function of the pressure applied thereto. The diaphragm is adapted to be connected to a movable controller means for controlling the speed



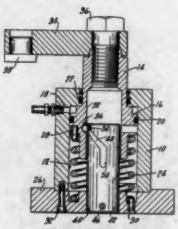
of the vehicle in accordance with the position of the diaphragm. Movable means are coupled to the diaphragm and are positioned within the chamber. The vacuum motor includes electrical circuit means and said movable means cooperates with the electrical circuit means for varying the value of a parameter of the electrical circuit means as a function of the position of the diaphragm and the movable means.

3,572,215
SINGLE ACTING STEAM ENGINE
Marion K. Harris, 14737 Charmeran Ave., San Jose, Calif. 95124
Filed June 26, 1969, Ser. No. 836,799
Int. Cl. F01b *13/04, 3/02;* **F15b** *15/22*
U.S. Cl. 91—480 **18 Claims**



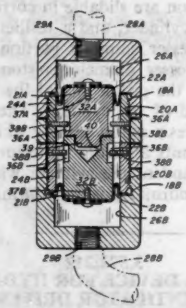
A single acting steam engine wherein means are provided for auxiliary exhaust through the piston when the auxiliary exhaust poppet is open and the auxiliary exchange passages of the piston register with the exhaust ports in the cylinder wall. The opening and closing of the auxiliary exhaust poppet are responsive to the rate of reciprocation of the pistons. A multiple of said engines may be utilized in combination to provide a multiple cylinder power plant. The engines may be adapted to drive a swash plate drive.

3,572,216
FLUID FORCE APPLYING DEVICE
Donald W. Seesody, Milwaukee, Wis., assignor to Applied Power Industries, Inc., Milwaukee, Wis.
Filed Apr. 23, 1969, Ser. No. 818,692
Int. Cl. F01b *3/04;* **F16h** *25/08*
U.S. Cl. 92—33 **8 Claims**



A work holding clamp in the nature of a self-contained hydraulic cylinder-piston unit in which one of the force applying members, for example the piston or ram, is rotatable and axially movable in its force-applying stroke.

3,572,217
COUPLING DEVICE FOR FLUID PRESSURE TRANSMISSION CONDUITS
Stuart E. Corry, 4511 S. Lewis Place, Tulsa, Okla. 74105
Filed May 15, 1969, Ser. No. 824,890
Int. Cl. F01b *19/02*
U.S. Cl. 92—48 **7 Claims**



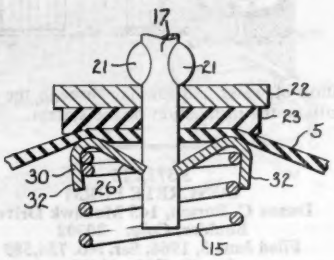
In a coupling device for fluid pressure transmission conduits, a first housing member connected to a first conduit and a second housing member connected to a second conduit are releasably joined. Each housing member contains a closed chamber having one end sealed by an impermeable membrane. Pressure in one of the closed chambers is imparted to the other chamber by means of a piston longitudinally slidable within the joined housing members and intermediate and contiguous with the impermeable membranes.

3,572,218

CONNECTING MEANS BETWEEN DIAPHRAGM AND ACTUATOR ROD

Herbert A. Gumtow, Brookfield, Wis., assignor to Briggs & Stratton Corporation, Milwaukee, Wis.

Filed Mar. 14, 1968, Ser. No. 713,209
Int. Cl. F01b 19/00
U.S. Cl. 92—99 2 Claims



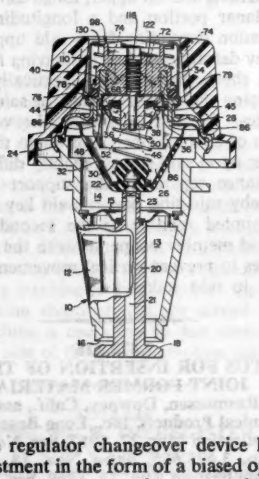
A hermetically tight connection between a flexible diaphragm and an actuator rod which passes through a hole in the diaphragm is provided by clamping the diaphragm between a washer which bears against a shoulder on the rod and a cup-shaped retaining member forced onto the rod and secured in place by fingers which bite into the rod. A coil spring seated in the cup-shaped retaining member biases the diaphragm in one direction.

3,572,219

MULTIPLE-CAM REGULATOR CONVERTER

Donald K. Murrell, Le Mirada, and Jay R. Katchka, Long Beach, Calif., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Oct. 15, 1969, Ser. No. 866,493
Int. Cl. F16k 7/16
U.S. Cl. 92—133 16 Claims



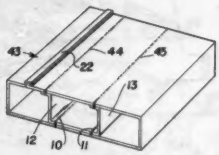
A pressure regulator changeover device having a two position adjustment in the form of a biased operator member movable along a cam surface to preclude any intermediate positioning thereof, and a low cam-angle double-action cam follower member operatively coupled to the biased operator member for setting the biasing means to one of two predetermined regulator settings.

3,572,220

PROCESS AND APPARATUS FOR THE CONTINUOUS MANUFACTURE OF INTERNALLY PARTITIONED TUBULAR LINERS

Robert W. Nerenberg, Middletown, Ohio, assignor to The Interstate Folding Box Company, Middletown, Ohio

Filed July 29, 1969, Ser. No. 845,712
Int. Cl. B31b 27/02, 27/74, 49/04
U.S. Cl. 93—8 6 Claims



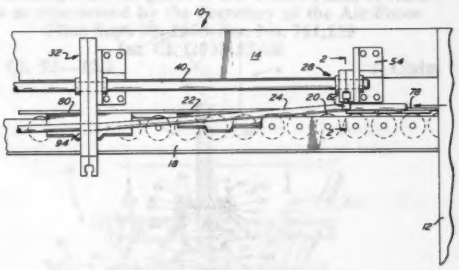
The continuous formation of tubular liners divided internally into three compartments by means of a single web of partition forming material.

3,572,221

BOX BLANK FOLDER

Theodore Baum, Mount Laurel, N.J., assignor to Harris-Intertype Corporation

Filed July 18, 1968, Ser. No. 745,889
Int. Cl. B31b 1/36
U.S. Cl. 93—52 10 Claims



A machine is disclosed for folding box blanks along a fold line and interconnecting the end panels of the box blank by gluing or taping. Means are provided to permit adjustment of a contact member while the machine is running so that the contact member engages the blank at substantially the same distance from a fold line to avoid blank distortion. Means are provided for simultaneously operating positioning means at spaced points along the contact member while the machine is running so that the optimum position for folding the blank may be achieved.

3,572,222

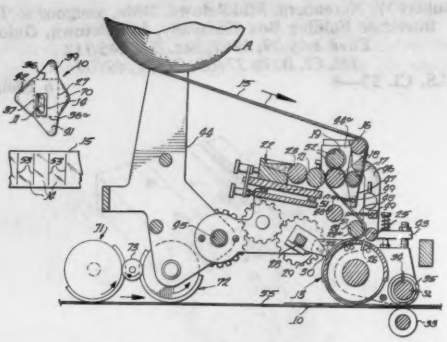
ATTACHMENT FOR A CONVENTIONAL NON-WINDOW ENVELOPE MACHINE

Ernst C. Sauerman, Chicago, Ill., assignor to Gaw-O'Hara Envelope Co., Chicago, Ill.

Filed Jan. 21, 1969, Ser. No. 792,443
Int. Cl. B31b 1/16, 1/82, 1/62
U.S. Cl. 93—61 6 Claims

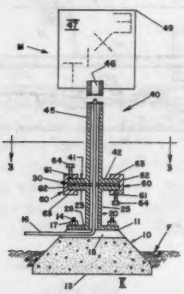
An attachment for a conventional non-window envelope machine for converting such machine into one in which a web of a patching material forming a window transparency is applied to a window envelope or a liner patch

is applied to the interior of a non-window envelope, and in which feed of the patching material is automatically



interrupted when there is an interruption in the supply of envelope blanks to each of which a patch is to be applied.

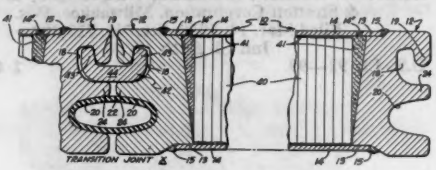
3,572,223
LATERALLY-DISENGAGEABLE HIGHWAY MARKER ASSEMBLY
Ralph L. Vierregger, 11664 Pierce, Omaha, Nebr. 68144
Continuation-in-part of application Ser. No. 674,261, Oct. 10, 1967. This application Aug. 26, 1969, Ser. No. 853,065
Int. Cl. E04h *12/00*
U.S. Cl. 94—1.5 **7 Claims**



The invention relates to a laterally-disengageable upright highway marker assembly that is relatively uprightly stable yet that is adapted to laterally disengage from its lower earth anchoring portion upon the application of relatively low lateral forces to said highway marker assembly, so that when a motor vehicle accidentally strays from the highway and strikes the upright signpost portion of the marker assembly, the lofty signpost portion will readily laterally disengage from the earth anchoring portion so as to minimize the likelihood and severity of injury to the motor vehicle's occupants.

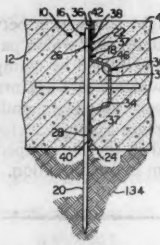
3,572,224
LOAD SUPPORTING PLANK SYSTEM
Robert E. Perry, Lafayette, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.
Filed Oct. 14, 1968, Ser. No. 767,447
Int. Cl. E01c *5/00*
U.S. Cl. 94—13 **18 Claims**

This invention relates to an improved load supporting plank system comprised of a series of removably interlocked planks wherein the joints formed by the various marginal edges of the interlocked planks are provided with unique locking and sealing means to prevent the



penetration of water and the like through the said joints and facilitate the installation of the system.

3,572,225
CONCRETE FORM
Duane C. Burton, 145 Mohawk Drive, Boulder, Colo. 80302
Filed June 5, 1968, Ser. No. 734,589
Int. Cl. E01c *11/02*
U.S. Cl. 94—17 **14 Claims**

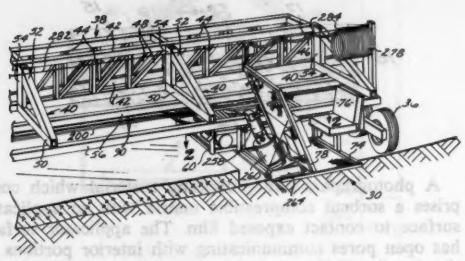


A concrete form used in forming a contraction joint between adjacent concrete slabs. The concrete form comprises a plurality of aligned stakes and an elongated relatively rigid sheet member. Each of the stakes has a generally vertically disposed body portion and at least a pair of said stakes has vertically spaced-apart support means disposed generally transversely to said body portion. The sheet member has an upper, longitudinally extending, generally planar portion and a longitudinally extending key deformation depending from said upper planar portion, said key deformation portion having first and second parts. The sheet member has vertically spaced-apart means engaging the support means of said stakes wherein the vertical distance separating the vertically space-apart means of said member is, prior to the mounting of said member upon said stakes, slightly different from the vertical distance separating the support means of said stakes whereby said first part of said key deformation is biasedly mounted relative to the second part and the means of said member cooperate with the support means of said stakes to prevent vertical movement of said member relative to said stakes.

3,572,226
APPARATUS FOR INSERTION OF TRANSVERSE JOINT FORMER MATERIAL
Donald W. Rasmussen, Downey, Calif., assignor to Edoco Technical Products, Inc., Long Beach, Calif.
Original application Mar. 27, 1967, Ser. No. 626,129, now Patent No. 3,478,655, dated Nov. 18, 1969. Divided and this application Aug. 21, 1969, Ser. No. 851,933
Int. Cl. E01c *19/00*
U.S. Cl. 94—39 **5 Claims**

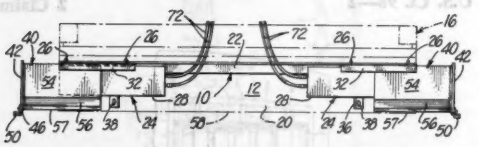
An apparatus for doing work of various types upon a large expanse of plastic concrete, and particularly upon the side slope and bottom of a relatively large canal, the

apparatus including an elongated frame for orientation transversely of the canal in overlying relation to the side slope and a portion of the canal bottom. The frame is transportable in successive movements along the canal for location over successive transverse sections, the frame



supporting a self-propelled car movable along the frame and carrying support structure adapted to mount feeding apparatus for inserting joint former strip material in the concrete of the canal while it is in a plastic condition, or to mount smoothing apparatus for providing a trowel-like finish on the concrete.

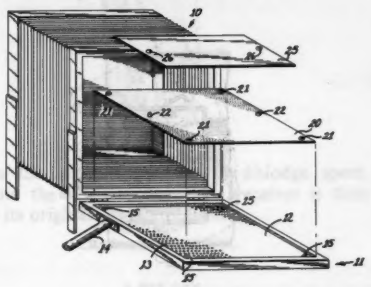
3,572,227
SCREED EXTENSION DEVICE
Arne Poulsen, Clackamas, Oreg., assignor to Gerald C. Bower, Inc., Orange, Calif.
Filed Dec. 5, 1968, Ser. No. 781,474
Int. Cl. E01c *19/22*
U.S. Cl. 94—45 **6 Claims**



A screed extension device is disclosed for use in conjunction with machines for laying asphalt pavement. Such machines normally employ a hopper for holding hot asphalt located so as to discharge this material into a distribution chamber where the asphalt is distributed generally over the area to be paved. As the machine is moved a screed member at the rear end of the distribution chamber tends to strike off and level off the asphalt deposited through the action achieved in the distribution chamber. The screed extension devices of the invention act as part of such a paving machine so as to increase the dimensions of the distribution chamber and the screed member as the paving machine is operating so that areas of varying widths on each side of the paving machine may be paved.

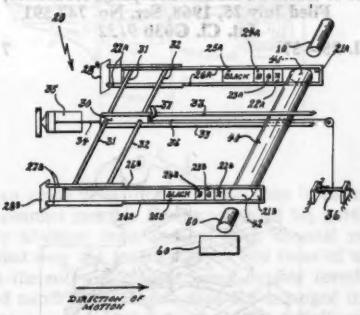
3,572,228
PHOTOGRAPHIC FILM PREREGISTER SYSTEM FOR CAMERAS
Norman A. Ternes, 387 Minnesota Ave., St. Paul, Minn. 55413
Filed Oct. 15, 1968, Ser. No. 767,642
Int. Cl. G03b *19/00*
U.S. Cl. 95—11 **2 Claims**

A plurality of pins fixedly attached to the film receiving surface of a camera having a vacuum back and a rigid screen having a plurality of holes therethrough positioned to cooperate with the pins to hold the rigid screen parallel and in juxtaposition to the film receiving surface of the camera back. The rigid screen has at least a pair of pins



extending outwardly therefrom for receiving a prepunched sheet of photographic film thereon so that the holes in the film can be used as constant reference points for an exposure, or picture, on the film.

3,572,229
SPRING ACTUATED SEQUENTIAL COLOR FILTER FOR IMAGE TUBES
Edgar Hutto, Jr., Cherry Hill, and Patrick F. Joy, Jr., Bellmawr, N.J., assignors to the United States of America as represented by the Secretary of the Air Force
Filed Sept. 20, 1968, Ser. No. 761,110
Int. Cl. G03b *33/08*
U.S. Cl. 95—12.2 **1 Claim**



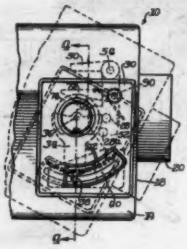
A method and an apparatus for taking color photographs of subjects at low light levels. Red, green and blue color filters are moved sequentially and linearly across the input face of an image intensifier tube. Simultaneously, red, green and blue color filters are moved sequentially and linearly across the output face of the image intensifier tube, in synchronization with the filters moving across the input face. An objective lens is forward of the filters moving across the input face and a relay lens is to the rear of the filters moving across the output face. The objective lens, the image intensifier tube, and the relay lens are co-axial, having the same optical axis. The filters are in planes perpendicular to said axis. Color film, behind the relay lens and perpendicular to its optical axis is used as the recording medium for the resultant intensified color image.

3,572,230

RANGE DETERMINING DEVICE WITH MANUALLY OPERABLE PENDULOUS MEMBER CONTROL

Stanley R. Freeland, Glenview, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Aug. 28, 1968, Ser. No. 755,882
Int. Cl. G03b 3/02
U.S. Cl. 95—44 9 Claims



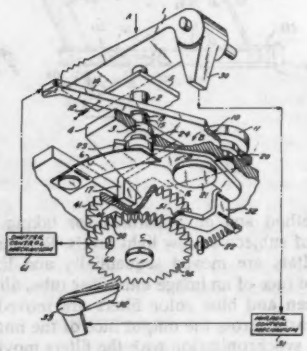
An improved objective focusing device for an optical instrument having a focusable objective and a freely swingable pendulous member which may assume an angular aspect corresponding to a focus distance. The objective is focused in response to a cam on the pendulous member. A manual control is connected to a driver which is selectively movable to engage and positively position the pendulous member. A holder prevents undue movement of the pendulous member and restrains the driver out of engagement for non-manual adjustment of the member.

3,572,231

DELAYED ACTION DEVICE FOR FOCAL PLANE SHUTTER CAMERA

Wolfgang Ort, Stuttgart-Bad Cannstatt, Germany, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed July 25, 1968, Ser. No. 747,591
Int. Cl. G03b 9/32
U.S. Cl. 95—57 7 Claims



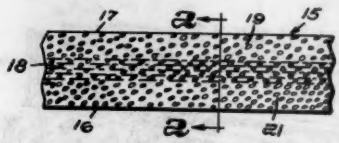
A photographic camera has a locking mechanism to prevent the second curtain of a delayed action two-curtain shutter from returning to its inoperative position until actuation of the first curtain shutter is completed. The locking mechanism is released by a gear member operating with the first shutter curtain.

3,572,232

PHOTOGRAPHIC FILM PROCESSING MATERIAL

Alvin Cronig, Lexington, Mass., assignor to Itek Corporation, Lexington, Mass.

Filed Apr. 1, 1968, Ser. No. 717,647
Int. Cl. G03d 9/00
U.S. Cl. 95—89 6 Claims



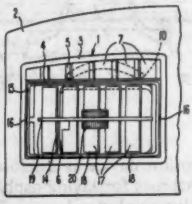
A photographic film processing material which comprises a sorbent compressible matrix with an applicator surface to contact exposed film. The applicator surface has open pores communicating with interior portions of the matrix where a viscous liquid photoprocessing reagent is impregnated into the matrix. The matrix has a boundary layer disposed between the interior portion and the applicator surface which is substantially free of processing reagent. Processing is accomplished by contacting the applicator surface with the exposed film surface and applying pressure thereto which forces the processing reagent from the matrix and onto the film.

3,572,233

VENTILATION AND DEFROST-AIR-DUCT-OUTLET FOR AUTOMOBILES

Alfons Bar, Russelsheim am Main, and Wolfgang Jobst, Pfungstadt, Germany, assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 19, 1969, Ser. No. 877,898
Claims priority, application Germany, Dec. 3, 1968, P 18 12 283.3
Int. Cl. F24f 7/04
U.S. Cl. 98—2 2 Claims



A ventilation and defrost air-duct-outlet comprises a first duct part connectable to a heated air supply, a second duct part connectable to a fresh air supply; and an outlet louvre assembly having fixed louvres opposite the first duct part, and having opposite the second duct part a rectangular frame containing louvres pivotable about an axis transverse to the axis of the louvres. The louvres in the frame are connected for simultaneous pivoting by a web at right angles to the louvres.

3,572,234

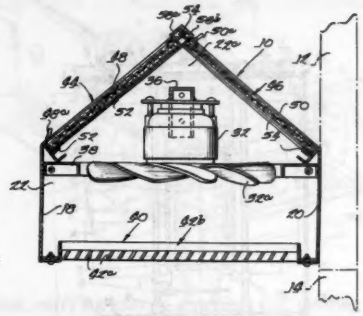
AIR SCREEN APPARATUS WITH FILTER REMOVAL MEANS

Edward P. Schoenthaler, Clarendon Hills, Ill. (4225 Saratoga, Downers Grove, Ill. 60515)

Filed Apr. 24, 1969, Ser. No. 818,955
Int. Cl. F24f 9/00
U.S. Cl. 98—36 11 Claims

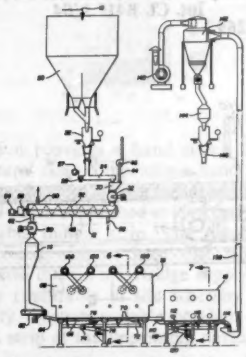
The air screen apparatus is mounted in juxtaposition with respect to a structure having an opening. Fans propel

the air, louvers direct the air across the opening, and a pair of filter panels disposed upstream from the fans are angularly spaced with respect to each other and with respect to the air stream. A member disposed between the



panels is movable between a first position wherein it covers the inner edges of the panels and permits withdrawal of the first panel and a second position wherein it permits withdrawal of said second panel.

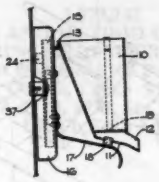
3,572,235
CONTINUOUS COFFEE ROASTING APPARATUS
Lee Nutting, Berkeley, George S. Chong, Kensington, Jarrott T. Miller, San Mateo, and John G. McChesney, Tiburon, Calif., assignors to Hills Bros. Coffee Inc., San Francisco, Calif.
Filed Apr. 1, 1969, Ser. No. 811,718
Int. Cl. A23f *1/02*
U.S. Cl. 99—236 **7 Claims**



Apparatus for the continuous roasting of coffee beans including an elongated pressure vessel having a conveyor for moving the coffee beans through the pressure vessel during a pretreating stage. An impression plate together with directed streams of high velocity roasting gases against the plate to form a fluidized bed for the roasting of the coffee beans. After roasting a conveyor removes the roasted coffee beans from the fluidized bed for cooling.

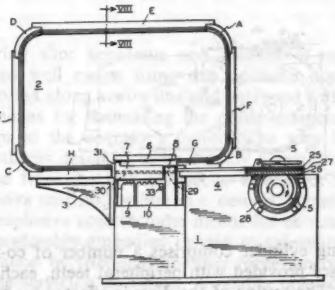
3,572,236
TEA DISPENSING MACHINE
John Alfred Greaves, Dudley, and Trevor David Illman, Warley, England, assignors to Fisholow Products Limited, Tipton, England
Filed Nov. 5, 1968, Ser. No. 773,449
Int. Cl. A47j *31/00*
U.S. Cl. 99—289 **6 Claims**

A tea dispensing machine which includes a receiver containing a filter element, means for delivering tea leaves and hot water to said receiver when it is in an upright position, means for inverting the receiver after the tea flavouring has been absorbed by the hot water which passes to a delivery station and means for applying an



impact to the inverted receiver to dislodge spent tea leaves from the filter element. The receiver is then returned to its original upright position.

3,572,237
STRAP GUIDE YOKE FOR AN AUTOMATIC STRAPPING MACHINE
Yasumori Kurihara, Kawasaki, Japan, assignor to Ikegai Tekko Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 13, 1968, Ser. No. 775,417
Claims priority, application Japan, Nov. 22, 1967, 42/97,932, 42/97,933
Int. Cl. B65b *13/04*
U.S. Cl. 100—26 **4 Claims**

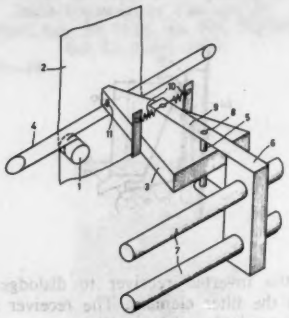


A strap guide yoke formed into a loop is constructed from a channel member having a pair of leg portions of generally U-shape cross section. Such channel member is provided over the length of each end faces of said leg portions thereof with one or more flexible members of long and narrow flat shape which are arranged in series in a manner as to permit the same to be partially renewed at least, and said channel member is formed into a unit by detachably assembling a plurality of respective quadrants and straight arms in a predetermined order.

3,572,238
PRINT-HEAD DRIVE
Adolf Andersen, Bremen, Germany, assignor to U.S. Philips Corporation
Filed Nov. 12, 1968, Ser. No. 774,699
Claims priority, application Germany, Nov. 15, 1967, P 16 11 474.2
Int. Cl. B41j *1/08, 1/56*
U.S. Cl. 101—93 **1 Claim**

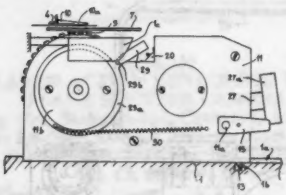
A print head drive for transforming a cable or band transmission to a step-by-step motion. The cable or band

transmission imparts an oscillatory motion to a slide element on which a print head is pivotally mounted. The



movement of the print head is limited to step-by-step increments by restraining springs.

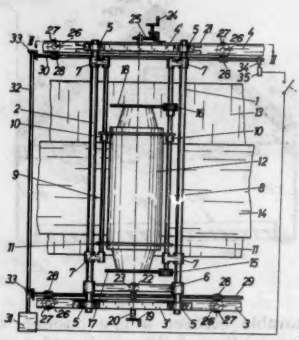
3,572,239
DRUM SERIES PRINTING WHEELS AND SETTING MEANS THEREFOR
Robert Grenier, Lyon, France, assignor to Societe Rhodanienne de Mecanographie, Lyon, Rhone, France
Filed Dec. 12, 1968, Ser. No. 783,319
Int. Cl. B41j *1/24, 1/26*
U.S. Cl. 101—99 **6 Claims**



The printing cylinder comprises a number of co-axial successive discs provided with peripheral teeth, each carrying a type. The setting of the discs is effected by means of a single toothed wheel slidably and rotatably mounted on a shaft parallel to the common axis of the discs so as to be brought into meshing engagement with any of them. The printing cylinder also comprises drums bearing removable printing blocks retained in depressions of the drums by a stationary outer casing having an aperture along the printing line of the cylinder. The cylinder is carried by a frame movable on the base of the pressing means of the apparatus between a printing position under the said pressing means, and a fully exposed composing position.

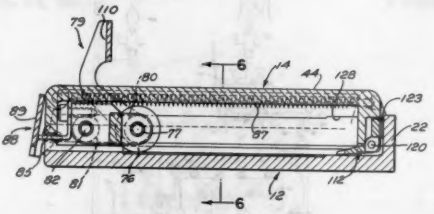
3,572,240
CYLINDRICAL PRINTING SCREEN SUPPORTING MEANS IN ROTARY SCREEN PRINTING MACHINES
Walter Böhm, Kirchbichl, Austria, assignor to Peter Zimmer, Kufstein, Austria
Filed Feb. 26, 1968, Ser. No. 708,318
Claims priority, application Austria, Mar. 2, 1967, A 2,001/67
Int. Cl. B41f *13/12, 15/10*
U.S. Cl. 101—116 **10 Claims**

A screen assembly for rotary screen printing machines having a pairs of parallel carriers extending transversely above the printing blanket in order to receive machine elements for the bearing or guiding support for drive of each of the cylindrical printing screens mounted between each pair of carriers. The pairs of carriers are adjustable



on the machine frame in both a transverse direction and a slightly angular longitudinal direction along one side, in a pivotal or rotative manner relative to a vertical pivot axis at the other or opposite side of the machine frame.

3,572,241
IMPRINTING DEVICE
John E. Waterman, Chepachet, R.I., assignor to The Entwistle Company, Providence, R.I.
Filed Sept. 22, 1969, Ser. No. 859,770
Int. Cl. B41f *3/04*
U.S. Cl. 101—269 **18 Claims**

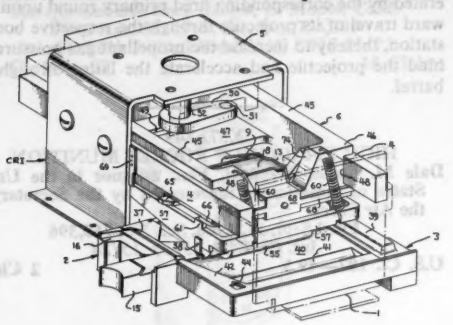


An imprinting device for transferring indicia from an embossed printing plate to a paper form, the device being portable in use in that it is sufficiently small enough to be carried in the hand or pocketbook of the user or in a holster on the user, and that includes a transfer roller assembly and a carriage that is readily movable in the imprinting operation, and that further includes a clamp for locating the paper form in the imprinting position when the cover of the device is latched to the base thereof.

3,572,242
CARD READER IMPRINTER
Lindsay Carlton Friend, Camp Hill, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Continuation of application Ser. No. 545,391, Apr. 26, 1966. This application July 14, 1969, Ser. No. 849,229
Int. Cl. B41f *3/04*
U.S. Cl. 101—269 **11 Claims**

A card reader imprinter comprises reading means for electrically reading coded information on a data card,

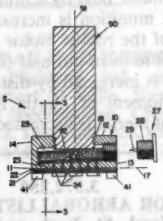
printing means for printing printable information on the data card onto a card to receive the printable information, and carrying means carrying the printing means and for operating the reading means.



3,572,243
SELF INKING HAND STAMP WITH RUPTURABLE INK CARTRIDGE MEANS

Victor P. Gronau, P.O. Box 276, Battle Creek, Nebr. 68715

Filed Nov. 6, 1969, Ser. No. 870,558
Int. Cl. B41k *1/52*
U.S. Cl. 101—327 10 Claims

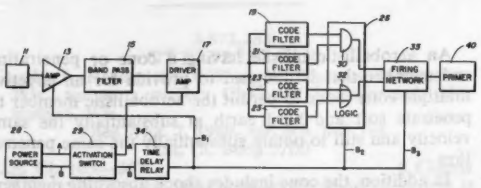


This invention provides a hand stamp imprinting device of the general class comprising a hand manipulatable block-like body having a longitudinally extending forward-side onto which is attached at least one longitudinally extending inkable indicia strip. The block-like body is internally provided with at least one closeable cavity adapted to receive therein a cartridge supply of ink which is permanently rupturable in situ whereby ink will flow from the cavity through suitable conduit means to the inkable indicia strip at the imprinting device forward extremity.

3,572,244
UNDERWATER FIRING DEVICE

Bruce D. Garber, Silver Spring, Md., assignor to the United States of America as represented by the Secretary of the Navy

Filed July 20, 1967, Ser. No. 655,720
Int. Cl. F42b *22/04, 22/38*
U.S. Cl. 102—18 5 Claims



A miniature underwater firing device which can be carried by a swimmer and be set off by remote acoustic coded signals. A receiver circuit comprising a hydrophone, amplifiers, a band pass filter, parallel connected narrow band code filters, logic circuitry and an acoustic relay connected in the signal path.

3,572,245
APPARATUS AND METHOD OF CONDUCTING STRING SHOT OPERATIONS

Bobby W. Grayson, 7306 Pembroke Ave., Oildale, Calif. 93308

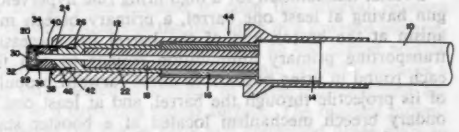
Filed Apr. 10, 1970, Ser. No. 27,214
Int. Cl. F42b *7/00*
U.S. Cl. 102—20 32 Claims

String shot apparatus and method of servicing perforated well casing using one or more explosive cords supported along a wire line and equipped with discriminator means for detonating the cords independently or in groups at the operator's option. The wire line includes centralizers designed to be quickly assembled to and detached from the line as well as means for securing the explosive cord to the line in a desired degree of tautness. The explosive cord includes means for eliminating stretch and preferably embodied therein to safeguard against its elongation by frictional or other forces encountered during the servicing operation. A readily opened and closed blowout protector is securable across the well head to seal the well closed about the wire line to avoid a blowout if the servicing operation releases high subsurface pressures into the well.

3,572,246
DETONATING FUZE SYSTEM

George F. Hare, Feasterville, and Bruce W. Travor, Holland, Pa., assignors to the United States of America as represented by the Secretary of the Army

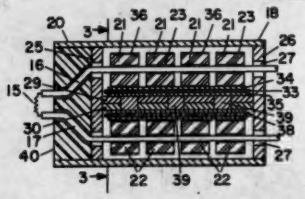
Filed Oct. 23, 1968, Ser. No. 770,029
Int. Cl. F42b *3/10*
U.S. Cl. 102—27 2 Claims



A mild detonating fuze system having an assured continuity of shockwave propagation. The core portion of a stripped end of a mild detonating cord, protruding from

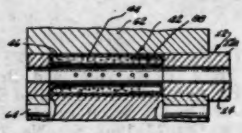
the end of a ferrule, is embedded in a high explosive filler within a booster shell cup that is secured to the ferrule.

3,572,247
PROTECTIVE RF ATTENUATOR PLUG FOR WIRE-BRIDGE DETONATORS
Theodore Warshall, 34 Stonehenge Road, Morristown, N.J. 07960
Filed Aug. 29, 1968, Ser. No. 756,230
Int. Cl. F42b *3/12*
U.S. Cl. 102—28 **21 Claims**



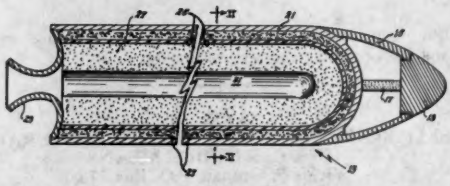
The plug portion of a wire-bridge detonator is replaced with a filter of the same physical shape and size. The input conductors for the bridge wire are each surrounded by a series of closely spaced ferrite beads. A conductive shield plate is provided between the conductors from which the ferrite beads are insulated by a strip of ceramic material on each side of the shield plate. The plug is provided with end shields of conducting material and an outer shield casing which may be of steel or other conducting material. The ferrite beads and the ceramic strips provide the inductive and capacitive elements of an RF filter or attenuator on the input conductors which operates to absorb stray radiated electromagnetic energy that might be picked up by these conductors, and prevents this energy from passing through to the bridge wire which might thus be prematurely fired thereby.

3,572,248
AMMUNITION FOR HIGH FIRING RATE HYPERVELOCITY GUN
David Dardick, Palos Verdes Estates, Calif., assignor to TRW Inc., Redondo Beach, Calif.
Original application Sept. 1, 1967, Ser. No. 665,155. Divided and this application Jan. 28, 1969, Ser. No. 794,697
Int. Cl. F41f *1/00;* **F24b** *5/20*
U.S. Cl. 102—39 **2 Claims**



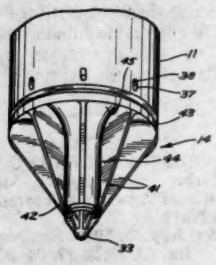
Booster ammunition for a high firing rate hypervelocity gun having at least one barrel, a primary breech mechanism at the breech end of the barrel for successively transporting primary ammunition rounds to and firing each round in firing position to effect forward propulsion of its projectile through the barrel, and at least one secondary breech mechanism located at a booster station along the barrel forwardly of the primary mechanism for successively transporting the booster ammunition rounds to firing position simultaneously with the primary rounds in such manner that the propellant charge in each booster round is exposed to and ignited by the propellant gas generated by the corresponding fired primary round upon forward travel of its projectile through the respective booster station, thereby to increase the propellant gas pressure behind the projectile and accelerate the latter through the barrel.

3,572,249
HIGH EFFICIENCY ROCKET MUNITION
Dale M. Davis, Freeport, Fla., assignor to the United States of America as represented by the Secretary of the Air Force
Filed Sept. 11, 1968, Ser. No. 760,396
Int. Cl. F42b *13/28, 15/24*
U.S. Cl. 102—49.3 **2 Claims**



A high efficiency rocket munition which utilizes the motor case as the warhead fragmentation case. The warhead explosive is installed inside the motor case and protected from the motor heat by a thin insulator. The lethality of the rocket munition is increased by the use of unburned portion of the rocket motor as an explosive in the event impact before burn-out and the stability of the spin stabilized rocket is increased by distributing the weight so that the axial moment of inertia is increased while the lateral moment of inertia is decreased.

3,572,250
CONE FOR AEROBALLISTIC MEMBER
Marshall S. Kriesel, St. Paul, and John D. Akerman, Minneapolis, Minn., assignors to Aerospace Systems Company, Minneapolis, Minn.
Filed Mar. 10, 1969, Ser. No. 805,636
Int. Cl. F42b *15/00*
U.S. Cl. 102—53 **8 Claims**



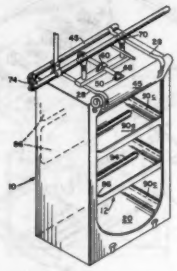
An aeroballistic missile having a cone or penetrating end member that is designed to provide for an effective multiple cone index to permit the aeroballistic member to penetrate soft and hard earth at substantially the same velocity and still to obtain substantially the same penetration.

In addition, the cone includes shock absorbing members which absorb impact loads when the cone strikes the earth to protect the pay load in the aeroballistic member.

3,572,251
MERCHANDISE CARRIER BAG

Richard B. Johnson, North Linthicum, Md., assignor to Aerojet-General Corporation, El Monte, Calif.

Filed Apr. 25, 1968, Ser. No. 724,209
Int. Cl. B61b *3/00*; B65d *85/18*; E01b *25/22*
U.S. Cl. 104—89 10 Claims

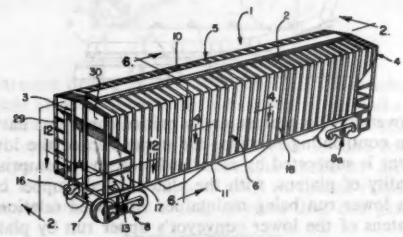


This invention relates to carrier bags for conveying systems as used in clothing warehouses and dry cleaning plants, laundries, and in other facilities. A collapsible carrier is provided optionally useable for garments hanging full-length therein or for flat work articles placed on shelves therein. The particular feature of the invention resides in an arrangement wherein the shelves are carried by an inner bag carried within the outer bag. The inner bag being foldable into the upper portion of the outer bag so as to leave the entire volume of the outer bag available for full-length hanging of garments.

3,572,252
COVERED RAILWAY HOPPER CAR

Kenneth P. Coover, Highland, Ind., and William Van Der Sluys and Herbert S. Wille, Homewood, Ill., assignors to Pullman Incorporated, Chicago, Ill.

Filed Jan. 2, 1968, Ser. No. 695,220
Int. Cl. B61d *17/08, 17/16, 7/02*
U.S. Cl. 105—248 23 Claims



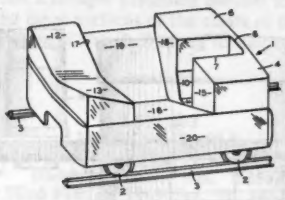
A railroad hopper car comprising integral roof and side structures of extruded aluminum welded to compartment structures of extruded aluminum to define a plurality of hatch-type hopper areas, each of the structures being a unit sheet with perpendicularly projected stiffeners to define the side sheeting and sideposts, the structures being held together by weldments and wherein there is also provided extruded bolster structure and draft sill construction at the ends of the car center sill.

3,572,253
GT EXPRESS CAR

Charles L. Roeder and William W. Klemme, Milwaukee, Wis., assignors to Rex Chainbelt Incorporated, Milwaukee, Wis.

Filed Aug. 7, 1969, Ser. No. 848,304
Int. Cl. B60p *3/00*
U.S. Cl. 105—367 6 Claims

The body of a car of a baggage transporting system is formed as a molded shell that is contoured to provide a longitudinal shallow V-bottom trough sloping downwardly from the rear to the front of the car to receive duffel bags, hooded golf club bags and similar generally cylindrical luggage and an intermediate section having vertical transverse walls and floor portions sloping downwardly

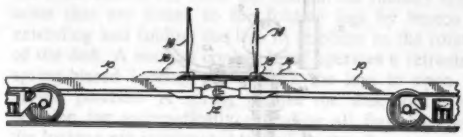


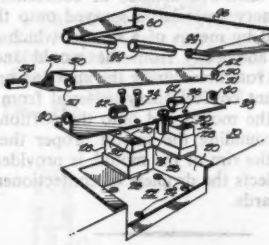
from the sides of the car and generally normal to each other for receiving and supporting the bottom and one end of suitcases and similar articles. The contours are such that luggage of either type may be discharged by tipping the car through an angle of 60° to 70° about a longitudinal axis.

3,572,254
BRIDGE PLATE CONSTRUCTION

Richard E. Slager, Prospect Heights, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed Dec. 16, 1968, Ser. No. 784,098
Int. Cl. B61d *3/00*; B65j *1/10*
U.S. Cl. 105—458 3 Claims





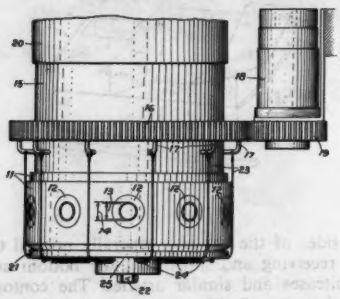
A bridge plate adapted to span the interval between two railway flatcars or the like when in a lowered horizontal position is pivotally mounted on an end corner portion of each of such cars. The bridge plate pivotally engages a hinge plate which is secured to a resilient mounting anchored to a suporting flatcar surface. The resilient mounting enables the bridge plate and connected hinge plate to rotate while such plate is in a horizontal lowered position, as when the two cars negotiate a curved track section.

3,572,255

FOOD PRODUCT FORMING APPARATUS

Robert G. Hall, Memphis, Tenn., Hubert E. Tobey, Maywood, N.J., and Daniel D. Korzekwa and Charles R. Dilday, Memphis, Tenn., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed May 19, 1969, Ser. No. 825,880
Int. Cl. A21c *11/16*
U.S. Cl. 107—14 10 Claims



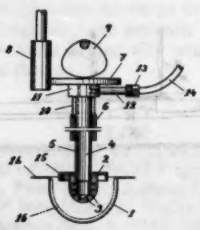
The food product forming apparatus consists of an annular ring in which are positioned a number of extruding dies. The tubular product which is extruded from the dies is cut to a given length by a number of wires passing across the face of the dies.

3,572,256

CONFECTIONERY ARTICLE MOULD

Sven Birger Westin, Skarsgatan 74, Goteborg, Sweden

Filed July 1, 1968, Ser. No. 741,504
Int. Cl. A23g *7/00*
U.S. Cl. 107—8 5 Claims



For moulding shell-like articles of confectionery the molten confectionery material is sprayed onto the walls of an open mould by means of a nozzle, which is reciprocable towards and away from the mould and which preferably also is rotatable during the spraying operation. In order to prevent confectionery material from flowing over the rim of the mould and onto the portions of the mould plate surrounding the mould proper the nozzle, about level with the rim of the mould, is provided with a shield, which deflects the droplets of confectionery material moving upwards.

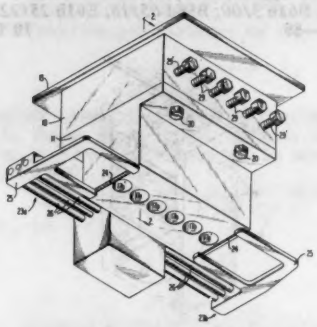
3,572,257

APPARATUS FOR EXTRUSION OF ICE CREAM

Ronald E. Minor and Sidney B. McMillion, Richmond, Va., assignors to Eskimo Pie Corporation, Richmond, Va.

Filed Nov. 13, 1968, Ser. No. 775,340
Int. Cl. A21c *11/16*
U.S. Cl. 107—14 10 Claims

An apparatus for manufacturing in quantity, pellets of ice cream and other frozen dessert confections of uniform size by continuously extruding lengths of the dessert in the form of a congealable mass from a plurality of orifices in a single extruder head and periodically severing the extruded lengths to form the individual pellets, each orifice being provided with means for adjusting the rate of flow of the congealable mass from the orifice.

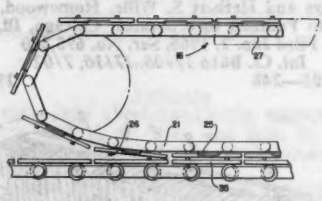


3,572,258

OVEN WITH SPACED CONFRONTING CONVEYORS

Frank P. Tangel, Oakland, N.J., assignor to Buitoni Foods Corporation

Filed May 9, 1969, Ser. No. 823,390
Int. Cl. A21b *3/00*
U.S. Cl. 105—57 8 Claims



An oven having heaters, and a pair of conveyors having runs in confronting relation; the upper run of the lower conveyor is supported by rails, each conveyor comprising a plurality of platens, with the platens of the upper conveyor's lower run being maintained in spaced relation to the platens of the lower conveyor's upper run by platen-carried elements which extend between the platens of the two conveyors, thereby providing a predetermined spacing between the platens of the two conveyors and providing for transfer of a part of the weight of the upper conveyor platens into the lower conveyor platens, and thence into supports which extend beneath the upper run of the lower conveyor.

3,572,259

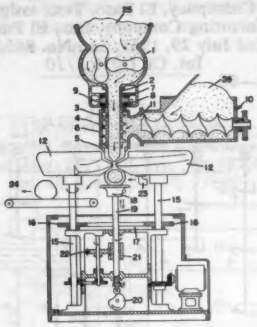
APPARATUS FOR MOLDING ELASTIC DOUGH MATERIALS FROM BAR SHAPES INTO SPHERICAL SHAPES

Torahiko Hayashi, 23 Nozawa-cho, Utsunomiya-shi, Japan

Continuation-in-part of application Ser. No. 719,465, Apr. 8, 1968. This application July 8, 1969, Ser. No. 839,908
Int. Cl. A21c *11/20*
U.S. Cl. 107—68 9 Claims

Apparatus for molding an elastic, malleable material such as bread dough, from a single or double layered bar

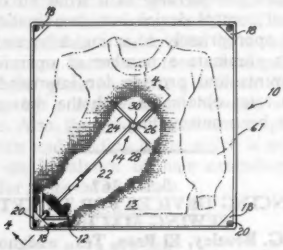
into a plurality of single or double layered balls by a means for stabilizing the bar as it is fed vertically downwardly between the peripheral edges of a pair of horizontally disposed cutters.



3,572,260
GARMENT DRYING APPARATUS

David Lehrman, Cheltenham, Pa., assignor to The Ironees Company, Philadelphia, Pa.

Filed Jan. 14, 1969, Ser. No. 790,949
Int. Cl. A47f 7/00
U.S. Cl. 108—24 12 Claims

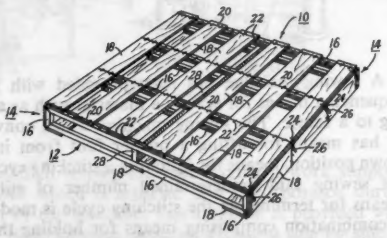


Garment drying apparatus is provided, comprising collapsible hingedly interconnected support arms, and a flexible, foraminous garment supporting member, coupled to distal upper ends of the support arms. In one form of the apparatus, a pair of foraminous members are provided, coupled to the support arms in spaced relation to facilitate simultaneous drying of more than one garment.

3,572,261
WIREBOUND PALLET

Kimon F. Vasiliou, Covent Station, N.J., assignor to Stapling Machines Co., Rockaway, N.J.

Filed June 26, 1969, Ser. No. 836,864
Int. Cl. B65d 19/18
U.S. Cl. 108—57 3 Claims

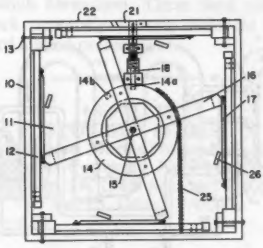


Wirebound pallet for fork-lift trucks comprising a shell having four sides formed by cleats extending transversely of the fork-lift tines and having mitered ends which abut at the corners to form spaced, open cleat frameworks, slats extending perpendicularly to the cleats and abutting their outer surfaces, binding wires encircling the shell in line with the cleats and being secured by staples, with loop fasteners securing the two ends of each binding wire together, and a stringer extending parallel to the slats and abutting the inner surfaces of the cleats of the wide upper and lower sides of the shell along its center line.

3,572,262
FOLDING TABLE

Leon S. Jones, 1204 N. Church St., Richland Center, Wis. 53581

Filed Feb. 20, 1969, Ser. No. 801,059
Int. Cl. A47b 3/00
U.S. Cl. 108—126 1 Claim

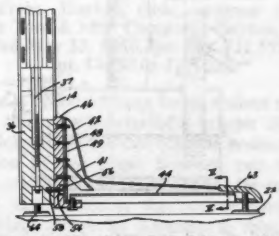


A folding table having operating means connecting all four folding legs for simultaneously controlling the movement thereof. A disk is rotatably centrally mounted on the underside of the table top and carries radially spaced arms that are linked to the folding legs by braces for extending and folding the legs in response to the rotation of the disk. A manual control lever operates a retractable spring-biased locking pin to lock the legs in open and closed position. A spring rotates the disk to its open position for automatically extending all four legs when the locking pin is retracted. Stabilizing wedges engage the disk arms when thetable legs are extended.

3,572,263
FURNITURE CONSTRUCTION

Robert L. Propst, Ann Arbor, Mich., assignor to Herman Miller, Inc., Zeeland, Mich.

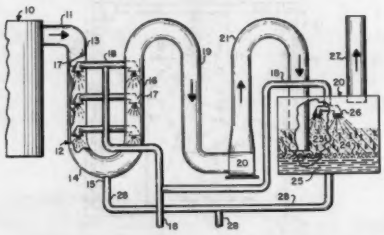
Filed June 13, 1968, Ser. No. 736,857
Int. Cl. A47b 5/02
U.S. Cl. 108—152 3 Claims



This disclosure relates to a furniture construction having a plurality of vertically disposed space divider components which are rigidly secured together by connector post structures. The divider has a stabilizer means in the

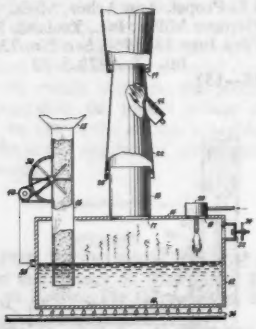
form of brackets at the floor to counterbalance modular units which can be supported by the post structures. The bracket member is attached to the post structure through a supporting bar and a screw, the head of which screw is positioned in a slot in the supporting bar between the post structure and the bracket member. Means are provided on the radial edges of the screw for turning the screw to attach the bracket construction to the bottom portion of the connector post structure. The same bracket is interchangeably useable as a support for cantilevered furniture components mounted on the space divider.

3,572,264
METHOD AND APPARATUS FOR REMOVING SMOG AND SMOKE
Joe F. Mercer, 302 E. Wallace St., Gonzales, Tex. 78629
Filed Sept. 11, 1969, Ser. No. 857,127
Int. Cl. F23g *3/00*
U.S. Cl. 110—8 **4 Claims**



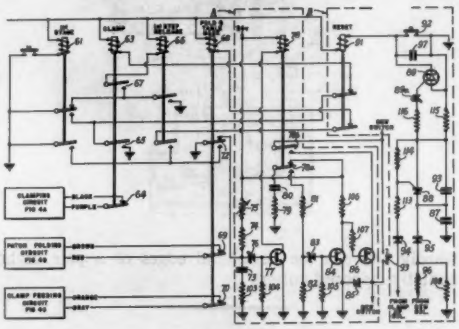
An improved method and apparatus for receiving the effluent or smoke discharge from a smoke stack or incinerator and removing visible smoke and suspended particles by washing and filtering the products of burning including a method of re-circulating the burned gases from the cleaning process into the combustion chamber.

3,572,265
PLASTIC BURNER
Richard F. Stockman, Friendship, N.Y., assignor to The Air Preheater Company, Inc., Wellsville, N.Y.
Filed Feb. 3, 1970, Ser. No. 8,162
Int. Cl. F23g *7/00*
U.S. Cl. 110—18 **6 Claims**



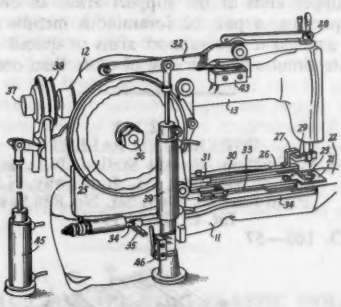
The method of and apparatus for incinerating a meltable plastic material by means of first reducing the plastic to a liquid, heating the liquid to vaporization, and then burning the fumes that are given off from the surface of the liquid before they may be exhausted to the surrounding atmosphere.

3,572,266
CONTROL DEVICE FOR REECE POCKET WELTING MACHINE
Rodney W. Champney, El Paso, Tex., assignor to Farah Manufacturing Company, Inc., El Paso, Tex.
Filed July 29, 1969, Ser. No. 845,711
Int. Cl. D05b *3/10*
U.S. Cl. 112—65 **6 Claims**



An improved control device has been provided for a sewing machine used to sew welts or piping such as for pants back pocket and button hole piping. The pocket welting machine is commonly known as a Reece pocket welting machine and is provided with control devices which require considerable skill from an operator. The novel circuit control device is a combination of a relay circuit and appropriately co-acting delay and control circuits which eliminate a number of operator controlled machine events and provide for improved sequencing. Production rates obtainable with the thus modified machines have been outstanding.

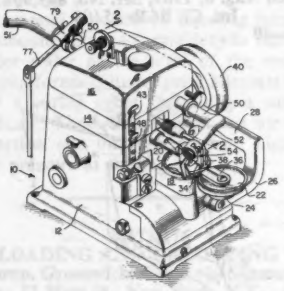
3,572,267
SEQUENCING DEVICES FOR TICKET TACKER SEWING MACHINES
Aubrey G. Beazley, El Paso, Tex., assignor to Farah Manufacturing Company, Inc., El Paso, Tex.
Filed Apr. 1, 1969, Ser. No. 811,714
Int. Cl. D05b *3/12, 69/20*
U.S. Cl. 112—67 **1 Claim**



A sewing machine has been provided with improved sequencing means for sewing a material such as a garment tag to a fabric. The sewing machine which conventionally has means for lifting a presser foot from its normal down position, means for initiating a stitching cycle, means for sewing said predetermined number of stitches and means for terminating the stitching cycle is modified with a combination comprising means for holding the presser foot in an automatically disengaged up-position; and means for initiating a stitching cycle and which last means comprise (a) means for deactivating the means for holding

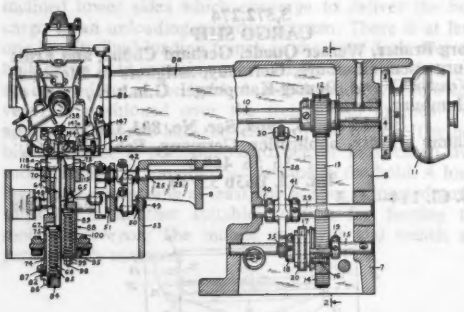
said presser foot in the up-position; and (b) means for sequentially interlocking: a presser foot engaging means; with the stitch sewing means; with the stitching cycle terminating means. The stitching cycle terminating means include means for reactivating the means for holding the presser foot in the up-position.

3,572,268
FUR SEWING MACHINE
Fred L. Olday, 505 Bogart Place, Scranton, Pa. 18503
Filed Aug. 22, 1969, Ser. No. 852,413
Int. Cl. D05b *35/00, 23/00*
U.S. Cl. 112—149 **11 Claims**



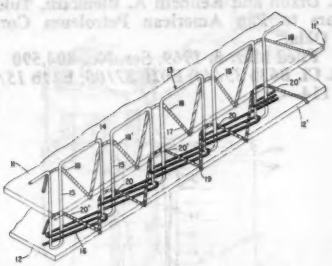
An improved apparatus for guiding strips of fur to the feed mechanism of a fur sewing machine. The apparatus is arranged to maintain a guide shoe in a variably positioned medial plane between a feed wheel pair and also within the medial plane to assure a uniform depth of fur skin taken up by a seam formed between strips to be sewn together. Also, the guide mechanism employs a combined air nozzle and guiding blade which is adjustable to account for an imbalance of hair extending from the edges of the fur strips on the seam.

3,572,269
BLINDSTITCH SEWING MACHINE
Roy W. Fletcher, Riverdale, and Anthony D. Forte, Chicago, Ill., assignors to Union Special Machine Company, Chicago, Ill.
Filed Dec. 3, 1969, Ser. No. 881,738
Int. Cl. D05b *1/24*
U.S. Cl. 112—178 **15 Claims**



A blindstitch sewing machine having a work supporting member which is retained in a fixed position during operation of the machine. The machine is provided with a pair of node forming elements arranged side by side in the work supporting member of the machine. These node-forming elements are simply reciprocated toward and away from the work and are adapted to produce nodes in the work being stitched at slightly different regions of the stitch forming zone of the machine. The node-forming elements are shifted in opposite directions in relation to each other, so that at one time one node-forming element will be active while at another time the other node-forming element will be active. For operating the node-forming elements by the main drive shaft of the machine a rotary eccentric member is provided which is driven at half the angular speed of the main drive shaft. This permits the shifting of one node former into active position and the other node former out of active position during one cycle of operation of the machine, whereas the reverse situation takes place on the next cycle of operation of the machine. No movement is imparted to the node forming elements in or opposite to the direction of movement of the work being stitched; the only movement of each node-forming element being perpendicular to the path of movement of the work in the stitch forming zone. Feed rollers are mounted on the work supporting member of the machine, with their axes perpendicular to the line of stitch formation. These feed rollers serve to urge the work upwardly in two different but adjacent regions toward a fixed presser foot.

3,572,270
STITCHED SEAMS
Stanley J. Ketterer, Morris Plains, N.J., assignor to The Singer Company, New York, N.Y.
Filed Oct. 28, 1969, Ser. No. 870,043
Int. Cl. D05c *17/00*
U.S. Cl. 112—433 **4 Claims**

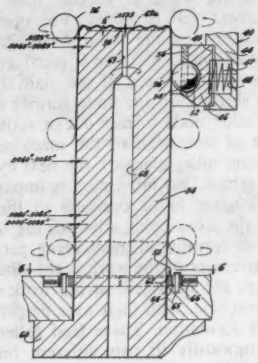


A stitched seam in which a single row of securing stitches parallel to the edges of two plies of fabric also anchors a pair of edge covering threads each extending about the edge of a respective one of the plies of fabric.

3,572,271
FABRICATION OF CAN BODIES WITH INTEGRAL BOTTOM WALLS
Ermal C. Fraze, Dayton, Ohio, assignor to Dayton Reliable Tool & Mfg. Company, Dayton, Ohio
Filed May 23, 1968, Ser. No. 731,592
Int. Cl. B21d *51/00*
U.S. Cl. 113—120 **11 Claims**

To produce a cylindrical can body, a sheet metal blank of an initial thickness substantially greater than the desired wall thickness of the can body is positioned with a central portion of the blank between two cooperating dies of substantially the diameter desired for the can body and the two dies compress the central portion of the sheet metal blank across its thickness to thin the central portion of the blank by radial extrusion of surplus metal. The consequent radial displacement of metal distorts the blank to an intermediate configuration of a receptacle having a conical circumferential wall with the axial dimension of the receptacle substantially short of the axial

dimension desired for the finished can body. The receptacle is placed on a mandrel that conforms to the inside dimensions of the desired can body for the purpose of carrying out a spinning operation that not only thins the circumferential wall of the receptacle and shapes the

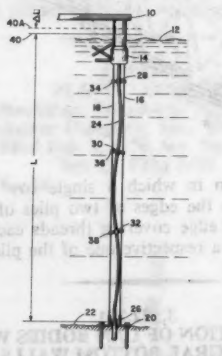


circumferential wall to the cylindrical configuration of the mandrel but also increases the axial dimension. This spinning operation is carried out by rolling means, such as ball means, which is moved helically around the mandrel.

3,572,272
MOORING SYSTEM USING CABLES AND BUCKLED RISER PIPE

David A. Dixon and Kenneth A. Blenkarn, Tulsa, Okla., assignors to Pan American Petroleum Corporation, Tulsa, Okla.

Filed Mar. 5, 1969, Ser. No. 804,590
Int. Cl. B63b *35/44*; E02b *17/00*; E21b *15/02*
U.S. Cl. 114—.5 **8 Claims**

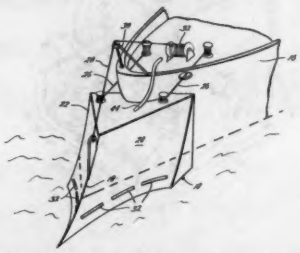


This invention relates to a mooring system for a floating structure. Special buoyancy chambers support the structure, including a work deck, above a body of water. The structure is connected to anchors at the floor of the body of water by elongated members such as cables and pipes having different elongations per unit of stress. The main anchoring load is carried by the cables and the pipes are used primarily in drilling operations or for transporting petroleum from an underwater well. Because of wave action, the floating platform is subject to vertical heave forces. The maximum vertical stress applied to the cables causes them to elongate a length ΔL. The riser pipe is installed under sufficient compression so that it is in a buckled configuration when the floating structure is in a neutral position. The length of the buckled riser pipe exceeds the vertical distance from the buoyancy means to the well head by an amount equal to the maximum ΔL of the cable. As the vertical distance increases by ΔL, the buckled riser will straighten, rather than elongate, without a change in axial force. Thus the basic load-carrying member remains the cable. In a preferred embodiment the cable is slideably connected to the points along the buckled riser pipe corresponding to the nodes of the buckled configuration.

3,572,273
APPARATUS FOR BREAKING A LAYER OF ICE ON A BODY OF WATER BY REPETITIVE COMBUSTIVE EXPLOSIONS

Charles D. Wood, San Antonio, Tex., assignor to Southwest Research Institute, San Antonio, Tex.

Filed Aug. 6, 1969, Ser. No. 847,904
Int. Cl. B63b *35/08*
U.S. Cl. 114—40 **13 Claims**

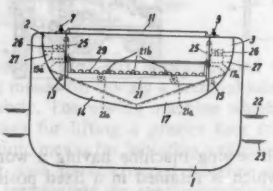


An apparatus to break the ice on bodies of water to allow passage of vessels by providing a movable buoyant body having a face for contact with the ice and a plurality of exhaust openings in the face and positioned below the waterline of the body with each exhaust opening connected to a combustion chamber for applying the combustion energy from a hydrocarbon fuel directly to the ice for breaking and melting the ice. A plurality of exhaust openings in the hull of an ice-breaker adjacent the bow with a normally closed combustion chamber connected to each opening. A buoyant pontoon non-rigidly attached to the bow of a ship and having a front face extending downwardly and outwardly to slide under layers of ice with a plurality of exhaust openings for providing a combustive explosion directed against the ice and having valve means normally closing the combustion chamber for preventing water entering therein but opening on a predetermined pressure buildup in the chamber.

3,572,274
CARGO SHIP

Georg Brauer, Werner Quade, Gerhard Chone, and Ernst Jurgensen, Hamburg, Germany, assignors to Blohm & Voss AG and Demag-Kampnagel G.m.b.H., both of Hamburg, Germany

Filed Feb. 24, 1969, Ser. No. 801,318
Claims priority, application Germany, Feb. 23, 1968, P 15 56 460.0
Int. Cl. B63b *35/44*
U.S. Cl. 114—43.5 **32 Claims**



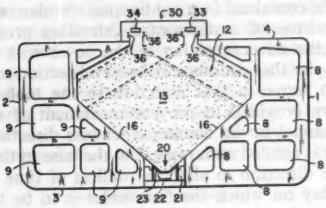
A barge carrier vessel wherein two rearwardly extending stern beams support an inflatable pontoon for lifting or lowering of barges. The pontoon is movable between

loading and stowed positions by seaway compensating winches or cylinders. A portal crane is mounted on the deck for movement lengthwise of the hull to transport barges onto and from the pontoon when the latter is held in stowed position.

3,572,275
METHOD OF RAISING A SUNKEN VESSEL
Fritz Kramer, 60—11 Broadway, Woodside, N.Y. 11377; Heinz Baumann, Zuckerfabrikstr. 3, Frankenthal, Germany; and Wilhelm Bauer, Kallenbergstrasse 21, Essen, Germany
No Drawing. Filed Jan. 10, 1969, Ser. No. 790,466
Int. Cl. B63c *7/12*
U.S. Cl. 114—50 **5 Claims**

A sunken vessel is raised by injecting into the vessel a sufficient amount of urea-formaldehyde resin foam generated under water at the level of the vessel from an aqueous urea-formaldehyde precondensate solution, a solution of a curing agent containing a surfactant, and compressed air. The solutions and the air are pumped to the injection site under a pressure higher than the hydrostatic pressure at the site.

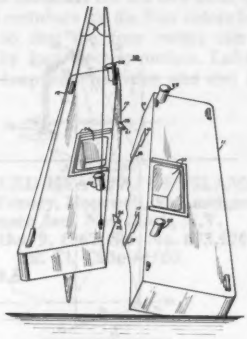
3,572,276
SELF-LOADING AND UNLOADING VESSEL
Ole Skaarup, Greenwich, Conn. (% Skaarup Shipping Corp., 21 West St., New York, N.Y. 10006)
Filed Apr. 14, 1969, Ser. No. 815,908
Int. Cl. B63b *25/02*
U.S. Cl. 114—73 **5 Claims**



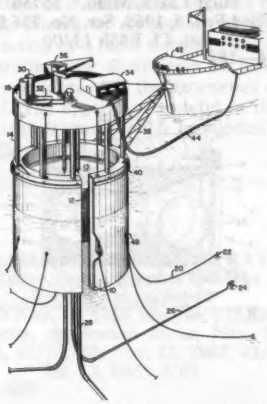
A self-loading and unloading dual cargo vessel for carrying a fluid cargo and a particulate bulk cargo. The vessel comprises marginal fluid cargo holds and a central bulk cargo hold therebetween. The bulk cargo hold has inclined lower sides which converge to deliver the bulk cargo to an unloading conveyor system. There is at least one longitudinal loading trench in the uper deck over the bulk cargo hold spanning substantially the entire fore and aft dimensions of the hold. A mobile and reversible conveyor is positioned over the trench and extends over approximately one-half the length of the trench. The mobile conveyor is positionable to deliver bulk cargo over substantially any longitudinal position in the hold. A loading device comprising at least one hopper is located amidships or in another suitable position for feeding the mobile conveyor. The mobile conveyor and trench are permanently enclosed.

3,572,277
LENGTHWISE DIVISIBLE BOAT
Sigurd Schousboe, Olympia Fields, Ill., assignor to Material Service Corporation, Chicago, Ill.
Filed Mar. 28, 1969, Ser. No. 811,313
Int. Cl. B63b *3/08*
U.S. Cl. 114—77 **8 Claims**

A boat is provided which is divisible into two or more separately buoyant sections lengthwise. These sections are connected by means of a mating ball and channel connecting device in opposing walls of the sections, and posts at the top of the walls which bear the main load in tension. The sections are designed to cant outwardly from each other when separate so that most of the load when connected is borne by the posts at the top.



3,572,278
FLOATING PRODUCTION PLATFORM
Richard P. Knapp and Kenneth T. Koonce, Houston, Tex., assignors to Esso Production Research Company
Filed Nov. 27, 1968, Ser. No. 779,407
Int. Cl. B63b *35/44*
U.S. Cl. 114—.5 **13 Claims**

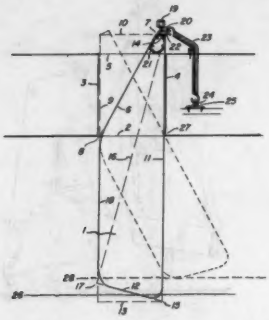


Apparatus including a substantially vertical annular buoyancy chamber formed by concentric cylindrical shells, the interior surface of which forms a cylindrical storage chamber that is open at its lower end. A plurality of circumferentially spaced vertical support members are mounted on the upper end of the buoyancy chamber and support a deck. The deck is adapted to have production equipment and tanker mooring apparatus mounted on it. The buoyancy chamber and associated structure may be moored to a submerged bottom.

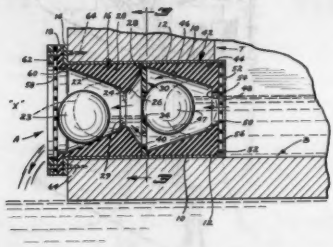
3,572,279
SHOCK-AND-DIG-RELIEVING DAGGERBOARD
Ernest Clyde Smoot, Jr., 6218 Dustin Drive, Richmond, Va. 23226
Filed Mar. 11, 1969, Ser. No. 806,081
Int. Cl. B63b *41/00*
U.S. Cl. 114—132 **8 Claims**

Daggerboard so shaped, mounted within and correlated with the boat well, that the board in response to

impingement of its lower end with the bottom submerged beneath the water, or with a solid fixed object, automatically pivots about a transverse axis fixed with the well, to thereby decrease the normal maximum projection of the board. Yielding means continuously urges the board into normal operating position. The board may also be manually elevated out of the well for all positions of pivoting thereof about the aforesaid axis.



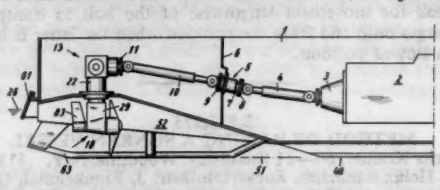
3,572,280
AUTOMATIC BOAT BAILER
Donald A. Monson, 439 Coventry Road, Hoyt Lakes, Minn. 55750
Filed Feb. 6, 1969, Ser. No. 796,999
Int. Cl. B63b *13/00*
U.S. Cl. 114—184 **6 Claims**



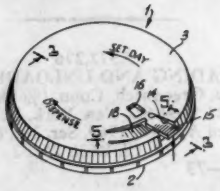
A device for automatically bailing water from a boat including a body member having a frusto-conical cavity in which is positioned a valve ball, said cavity open at its outer and inner ends, the inner opening having a valve seat for receiving the valve ball to close off the inner opening and means for maintaining the valve ball in the cavity.

3,572,281
WATERCRAFT
Josef Becker, Oberspay (Rhine), Germany, assignor to Schottel-Werft Josef Becker KG., Oberspay (Rhine), Germany
Filed Dec. 23, 1968, Ser. No. 785,904
Claims priority, application France, Dec. 26, 1967, 133,733
Int. Cl. B63h *5/08, 1/14*
U.S. Cl. 115—37 **12 Claims**

A watercraft having a pair of substantially parallel, longitudinally arranged, recesses or tunnels positioned below the waterline in the after portion of its hull and a suitably driven propeller located within each recess and mounted for pivoting around a vertical axis. Flaps close the after end of said recesses when the craft is operating in reverse and the engine is preferably placed forwardly of the forward end of said recesses.

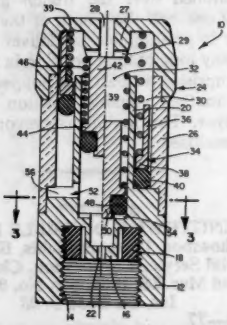


3,572,282
TABLET DISPENSER WITH CIRCULAR TABLET CHANNEL
Dirk Tump, Lebanon, and Charles M. Huck, Bound Brook, N.J., assignors to Ortho Pharmaceutical Corporation
Filed Apr. 4, 1969, Ser. No. 813,576
Int. Cl. G09f *9/00*
U.S. Cl. 116—121 **3 Claims**



A calendared tablet dispenser is provided in which the tablets are contained in a continuous circular tablet channel. By virtue of a downward extending projection secured to the cover, rotation of the cover with respect to the base in the counter-clockwise direction causes the tablets to move in that direction in the tablet channel. Means are provided to prevent movement of the tablets in the channel in the counter-clockwise direction. In use, the cover is rotated with respect to the base in the counter-clockwise direction to align the indicia of time representing the day on which the first tablet is to be taken with the tablet access aperture. In dispensing of the tablet, the cover is rotated in the clockwise direction.

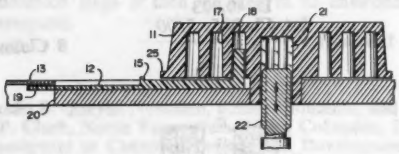
3,572,283
TIRE PRESSURE INDICATOR
Robert B. Ashman, St. Louis, Mo., assignor to Scovill Manufacturing Company, Waterbury, Conn.
Filed July 15, 1969, Ser. No. 848,390
Int. Cl. B60c *23/06*
U.S. Cl. 116—34 **4 Claims**



A cap type tire pressure indicator comprises a valving piston which when pushed up by air pressure permits air

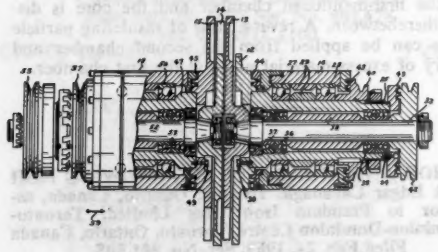
pressure to communicate to a second chamber wherein the air pressure holds up an indicating piston. When the tire pressure drops, the valving piston lowers to valve off passage to the second chamber permitting the indicating piston to drop to a visible position to indicate inadequate pressure in the tire.

3,572,284
CONTROL KNOB ASSEMBLY
William D. Rattan, Paramount, Calif., assignor to Robertshaw Controls Company, Richmond, Va.
Filed Dec. 15, 1969, Ser. No. 884,809
Int. Cl. G09f *9/00*
U.S. Cl. 116—124 **5 Claims**



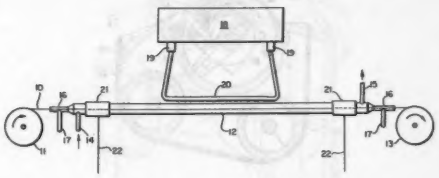
A control knob assembly is disclosed wherein rotational movement of the control knob effects radial movement of a cooperating indicator. The knob is provided with a spiral channel in its undersurface for receiving a leg of the L-shaped indicator. The longer leg of the indicator extends radially outward from the control knob axis through a slot in the assembly housing. Hooks integral with the housing are adapted to grip a peripheral flange on the knob to retain the dialed position. At least one of the hooks is provided with a convex dimple which cooperates with corresponding concave dimples about the periphery of the knob to provide a "click" indicative of an incremental change in the control knob setting. The knob is further provided with a spline or keyway arrangement which accommodates axial movement of the stem.

3,572,285
WIDE BAND SIREN SYSTEM
Howard F. Wolfe, Kettering, Ohio, assignor to the United States of America as represented by the Secretary of the Air Force
Filed Nov. 5, 1969, Ser. No. 874,167
Int. Cl. G01k *7/00*
U.S. Cl. 116—147 **3 Claims**



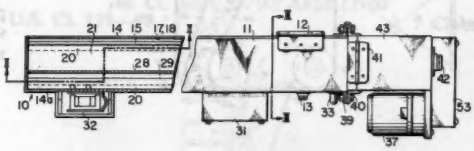
A wide band noise source having four siren rotor blades positioned in close proximity to each other and supported within two ring support members which are secured to a base support member. The two outer rotor blades are each supported on journal members in two bearings in the ring support members. The two center rotor blades are supported on shaft journal members in four bearings supported within the journal members for the two outer rotor members. The journal members for the four rotors have pulleys keyed to them so that the four rotors can be driven through V-belts by four electric motors. Labyrinth seals are provided to keep dust particles and dirt away from the bearings.

3,572,286
CONTROLLED HEATING OF FILAMENTS
Harry B. Forney, Hopewell, Va., assignor to Texaco Inc., New York, N.Y.
Filed Oct. 9, 1967, Ser. No. 673,570
Int. Cl. C23c *11/00*
U.S. Cl. 118—49.5 **3 Claims**



Electrically conductive filaments are heated by establishing in a section of the filament a standing half wave of high frequency current by subjecting the section to be treated to the action of a radio frequency electromagnetic field and controlling the distribution of temperature in such section by adjustment of the parameters of the radio frequency field. The apparatus is useful in the provision of controlled temperature profiles in selected sections of a conductive filament.

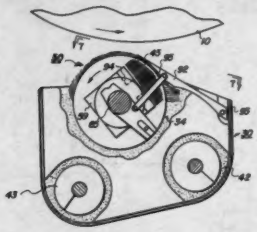
3,572,287
APPARATUS FOR POWDER SPRAYING
Shiro Saito, Tokyo, Japan, assignor to Nikka Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 14, 1968, Ser. No. 775,835
Claims priority, application Japan, Nov. 16, 1967, 42/73,754, 42/73,755; Nov. 22, 1967, 42/74,721
Int. Cl. B05b *5/02*
U.S. Cl. 118—629 **9 Claims**



An elongated square-shaped fluidizing case contains an outlet for the powder to be sprayed, a vertical weir board and a horizontal porous rectifying board. An air chamber for introducing compressed air into a powder layer is located below the rectifying board, and a fluid chamber communicating with the outlet is provided above the rectifying board. A device for feeding a fixed amount of powder continuously to the fluid chamber is connected

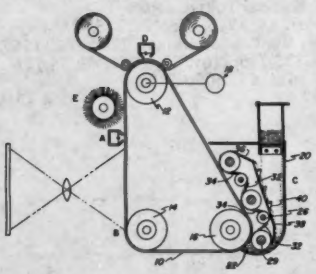
with the fluidizing case. When the powder is fed into the fluid chamber, the air blowing from the air chamber forms a fluidized bed of powder. The powder elutriated from the fluidized bed is ejected by the air through the outlet to be sprayed upon the surface of the object being treated.

3,572,288
DEVELOPMENT APPARATUS
Lyman H. Turner, Pittsford, N.Y., assignor to Xerox Corporation, Rochester, N.Y.
Filed Aug. 7, 1968, Ser. No. 750,851
Int. Cl. B05b 5/02
U.S. Cl. 118—637 4 Claims



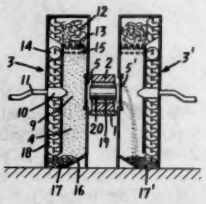
Apparatus to control the stopping and starting function of a magnetic brush developing system in which the magnetic brush is rapidly brought in and out of operative contact with an image bearing photoconductive surface.

3,572,289
MAGNETIC BRUSH DEVELOPMENT APPARATUS
John Maksymiak, Penfield, N.Y., assignor to Xerox Corporation, Rochester, N.Y.
Filed Sept. 23, 1968, Ser. No. 761,723
Int. Cl. B05b 5/02
U.S. Cl. 118—637 5 Claims



Xerographic apparatus for the magnetic brush development of latent electrostatic images with a two-component magnetic developer. The apparatus includes a plurality of rollers with magnetic fields extending therefrom positioned adjacent a latent electrostatic image bearing surface to be developed with their axes of rotation parallel to each other. Drive means are provided to rotate each roller in a direction opposite to each adjacent roller. In this manner, alternate rollers function as magnetic brush developing rollers while the intermediate rollers function as developer transport rollers to magnetically transport the developer from one developing roller to the next. When a sump of developer is provided adjacent the lowermost roller, gravity may be utilized to return developer from the uppermost roller to the sump. Baffles may also be employed to cross-mix developer returning to the sump.

3,572,290
APPARATUS FOR INSULATING SLOTS IN STATORS AND ROTORS OF ELECTRICAL ROTARY MACHINES
Erik Frede Christiansen, Sonderborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark
Original application Jan. 30, 1964, Ser. No. 341,257. Divided and this application Jan. 10, 1968, Ser. No. 696,855
Claims priority, application Germany, Feb. 1, 1963, D 40,803
Int. Cl. B05c 5/00
U.S. Cl. 118—641 8 Claims

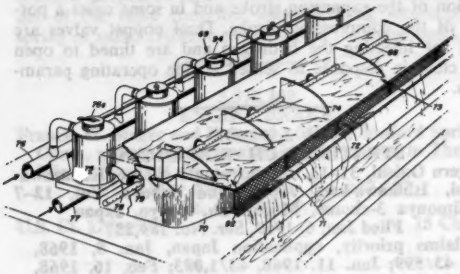


Apparatus for coating winding slots of electrical motor cores such as stators or rotors with streams of insulating particles developed externally of an area in which the unit to be insulated is disposed and applying the coating particles only on desired surfaces of the slots being coated without contamination of the atmosphere in which the unit being coated is disposed so that there is substantially no deposition of insulating particles on surfaces other than those being coated. Particles are suspended in a chamber and then subjected to gas flow through the chamber and an outlet shutter or mask so that the insulating particle streams of different cross sections are formed sequentially as the gas flow leaves the chamber and enter the area in which the core being coated is displaced. The area and atmosphere in which the core is disposed is thus free of particles except for the streams of particles passing through the area in the slots. Excess particles leaving the slots are recovered in a second chamber outside of the area in which the core is disposed. The second chamber is opposite to and spaced from the first-mentioned chamber and the core is disposed therebetween. A reverse flow of insulating particle streams can be applied from the second chamber and recovery of excess material made at the first chamber.

3,572,291
METHOD AND APPARATUS FOR GROWING FISH
Patrick Edgar Cavanagh, Toronto, Ontario, Canada, assignor to Premium Iron Ores Limited, Toronto-Dominion-Dominion Centre, Toronto, Ontario, Canada
Filed Feb. 24, 1969, Ser. No. 801,505
Claims priority, application Canada, Dec. 16, 1968, 37,983
Int. Cl. A01k 61/00
U.S. Cl. 119—3 9 Claims

The following specification discloses a fish selected environmental control for growing fish to increase the rate of growth. Fish are moved there in production stage and

subjected to a range of environmental values of which they are observed to select the optimum. The particular

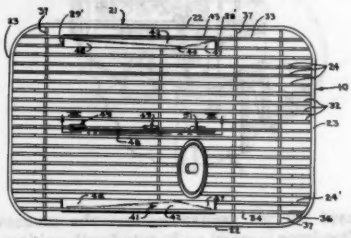


production stage is then adjusted in its environment to correspond.

3,572,292
ARTIFICIAL OYSTER CULTCHES
Daniel B. Quayle, Nanaimo, British Columbia, and Trevor P. Clark, North Vancouver, British Columbia, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Ontario, Canada
Filed June 27, 1969, Ser. No. 837,088
Int. Cl. A01k *61/00*
U.S. Cl. 119—4 **9 Claims**

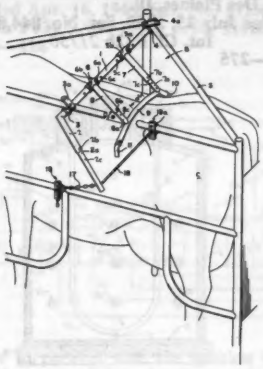
An artificial oyster cultch made up of a thin body of any desired shape, having opposite face sides with bearing surface means on one side, and spacer means projecting from the opposite side thereof and adapted to bear against the bearing surface means of the body of another cultch when the cultches are operatively placed together. The bearing surface means and the spacer means are positioned to keep most of the cultch bodies separated from each other when they are in operative positions, usually in a vertical column including a plurality of cultches held together on a wire or string.

3,572,293
ANIMAL FEEDER
Frederick N. Schroen, Portage, Mich., assignor to Unifab Corporation, Kalamazoo, Mich.
Filed Feb. 19, 1969, Ser. No. 800,678
Int. Cl. A01k *1/00*
U.S. Cl. 119—18 **7 Claims**



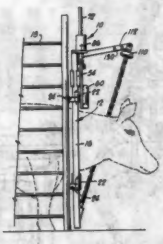
A nestable tray for placement over the top of a container for animals, said tray being adapted for holding articles within reach of the animals in the container. The tray has an elongated trough which projects down into the container and the end plates of the trough are inclined to the vertical to permit a nesting of one of said trays within another. A center plate is provided for dividing the trough into two compartments, said plate being pivotable to a position parallel with one of the walls of the trough so as to permit nesting of said trays.

3,572,294
COW CONTROLLER
Wallace L. Baker, Rte. 3, Box 9, Burley, Idaho 83318
Filed Apr. 5, 1968, Ser. No. 719,175
Int. Cl. A01j *1/00, 3/00*
U.S. Cl. 119—27 **7 Claims**



A device wherein positive pressure is applied in the sway of the back of an animal to prevent arching of the back to thereby prevent kicking and sidewise movement of the animal. The pressure bar is curved so as to fit the contour of the back but with a special straight portion to effectively engage the backbone. A spring is utilized to normally retain the pressure bar in an inoperative position and an opposed chain is used for adjustable holddown whereby the device can be quickly engaged and disengaged. The pressure bar assembly is positioned at an angle to the animal in the operative position to prevent overcenter travel and resultant loss of positive pressure. Adjustments are provided to make rough adjustments for different size animals.

3,572,295
ANIMAL SECURING GATE
Cecil L. Tansel, Rte. 4, Box 165, Chandler, Okla. 74834
Filed Oct. 6, 1969, Ser. No. 864,137
Int. Cl. A01k *29/00*; A61d *11/00*
U.S. Cl. 119—98 **7 Claims**



The present invention relates to an animal securing gate adapted to be installed on a stock chute and the like. The gate basically comprises a rectangular frame having means for engaging the lower portion of an animal's

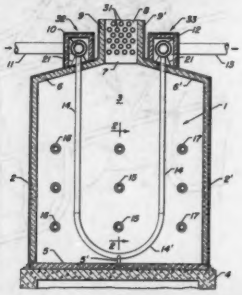
neck attached thereto. A movable frame including a neck depressing member positioned in vertically opposed relation to said means for engaging the lower portion of the animal's neck is slidably attached to the frame, and electric means are provided for automatically releasing the movable frame when an animal extends its head and neck through the gate thereby forcing the animal's neck into engagement with the means for engaging the lower portion thereof and securing the animal in the gate.

3,572,296

LOW PRESSURE DROP HEATER FOR FLUIDS

Don B. Carson, Mount Prospect, and Marion W. Barnes, Glenview, Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed July 25, 1969, Ser. No. 844,837
Int. Cl. F22b *21/30*
U.S. Cl. 122—275 **7 Claims**



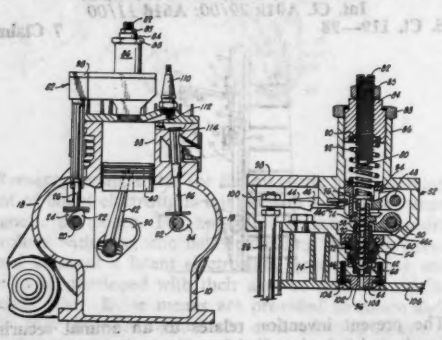
A heater for fluids which provides a low pressure drop for fluid flow by having a plurality of spaced apart U-shaped conduits positioned across the heating zone to connect in a parallel flow manner between spaced, longitudinally extending headers. Preferably, long flame burners provide radiant heating to each side of each leg of the U-shaped conduits by having at least three lines of burners to introduce heating from each end of the heating chamber such that flame and hot gases will provide radiant heat to the opposing inner faces of the U-shaped conduits as well as to the sides facing the side walls of the heater.

3,572,297

HYDROGEN FUELED INTERNAL COMBUSTION ENGINE

Richard G. Murray, Perkins, Okla., assignor to Roger J. Schoeppel and Roger C. Allen, Stillwater, Okla.

Filed Jan. 26, 1970, Ser. No. 5,791
Int. Cl. F02b *1/10, 3/04, 43/12*
U.S. Cl. 123—1 **21 Claims**



This invention relates to an internal combustion engine operated by direct injection of hydrogen into the cylinders thereof. Hydrogen is mixed with a portion of the air in the cylinders to form a combustible mixture which is ignited and burned concurrently with injection over a portion of the expansion stroke and in some cases a portion of the compression stroke. Dual poppet valves are used for injecting the hydrogen and are timed to open and close in response to sensed engine operating parameters.

3,572,298

STRATIFIED CHARGE ENGINE

Shigeru Onishi, 31–13 Higashiyama 3-chome, Kanazawa-shi, Ishikawa-ken, Japan, and Saburo Yui, 12–7 Himonya 3-chome, Meguru-ku, Tokyo, Japan

Filed Jan. 6, 1969, Ser. No. 789,227
Claims priority, application Japan, Jan. 8, 1968, 43/599; Jan. 11, 1968, 43/1,083; Feb. 16, 1968, 43/9,413; June 10, 1968, 43/39,424; July 27, 1968, 43/52,757
Int. Cl. F02b *72/00*
U.S. Cl. 123—32 **8 Claims**

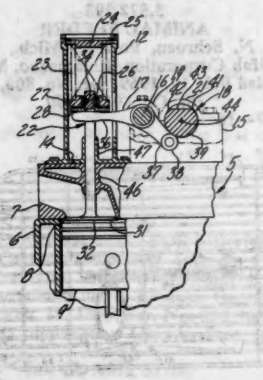
An internal combustion engine of the stratified charge type wherein the purification of the exhaust fan from the combustion chambers is provided with elimination of noxious components in the emissions thus attaining improved ignitability and combustibility particularly for betterment of performance and durability in full load operation.

3,572,299

VALVE-ACTUATING TRAIN FOR MACHINERY HAVING A CYCLICLY OPERATED POPPET VALVE

Thomas J. Lester, Moreland Hills, Ohio, assignor to Lester Industries, Inc., Bedford Heights, Ohio

Filed Dec. 15, 1969, Ser. No. 885,151
Int. Cl. F01l *1/30, 1/08*
U.S. Cl. 123—90.25 **14 Claims**



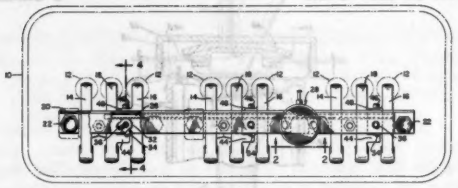
An engine, especially of the internal-combustion valve-in-head type, wherein a valve controlling cam and a cam follower of a valve train act positively on the valve to

hold it closed against a seat facing inwardly of the combustion chamber except when the cam rotates through a minor portion of each revolution to release the remainder of the valve train for valve opening whereupon a spring or other resilient means forces the valve open.

3,572,300
ENGINE BRAKE

Francis W. Stager and Robert N. Minor, Stafford Springs, Conn., assignors of a fractional part interest to Thomas Minor, Crystal Lake, Conn.

Filed May 23, 1969, Ser. No. 827,227
Int. Cl. F02d *9/00*
U.S. Cl. 123—97 **15 Claims**

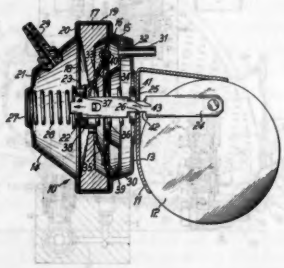


A control for converting a power producing internal combustion engine into a power absorbing air compressor is disclosed. The control includes rotatable cams positioned between injector rocker arm actuating bosses and corresponding structure on the exhaust valve rocker arms. Flexible coupling is provided between the individual cams and the actuating mechanism whereby rapid response of the control is achieved and movement of the cams into and out of operative position is achieved at the proper times through a mechanism which remembers the desired operative mode.

3,572,301
VACUUM ADVANCE MECHANISM FOR IGNITION DISTRIBUTORS OF INTERNAL COMBUSTION ENGINES

Harald Kalippke, Hohenacker, Eduard Lochbrunner, Immenstadt, Wolfgang Krill, Stuttgart, Leo Steinke, Hegnach, and Wilfried Julicher, Stuttgart, Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Dec. 26, 1968, Ser. No. 787,021
Claims priority, application Germany, Jan. 5, 1968, P 16 01 425.8
Int. Cl. F02p *5/10*
U.S. Cl. 123—117 **16 Claims**

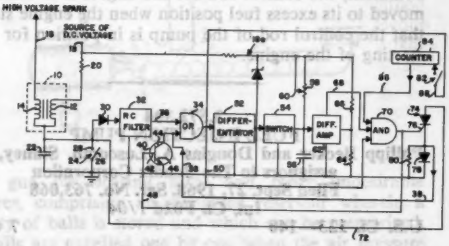


A vacuum advance mechanism for the breaker plate in the ignition distributor of an internal combustion engine comprises a housing defining two suction chambers each flanked by a separate diaphragm. One of the chambers is connected with a first region of the intake manifold where the suction increases when the engine operates at partial load, i.e., when the spark should be advanced. The other chamber communicates with a second region of the intake manifold where the suction increases during idling or coasting of the engine. The diaphragms which respectively flank the one and the other chamber move or effect movement of the breaker plate in the ignition distributor in opposite directions when the suction in the respective chambers increases.

3,572,302
INTERNAL COMBUSTION ENGINE SPEED LIMITING APPARATUS

Donald L. Wollesen, San Jose, Calif., assignor to ARE Incorporated, San Jose, Calif.

Filed Apr. 16, 1969, Ser. No. 816,647
Int. Cl. F02p *9/00*; H02p *3/00*; H02h *3/00*
U.S. Cl. 123—118 **16 Claims**

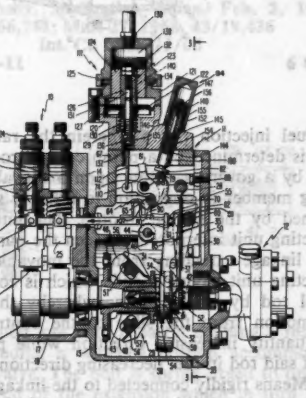


A thyristor in parallel with the ignition timing switch of an internal combustion engine is turned on to prevent ignition sparks at the desired limiting speed. Timing is provided by fixed duration pulses having a time duration equal to the time between ignition sparks at the limiting speed. The effects of ignition timing switch contacts bouncing are prevented by the thyristor shorting out the bouncing contacts and dwell time is increased to near the theoretical maximum by allowing current flow to the ignition coil by way of the thyristor when the ignition timing switch contacts are open and after the ignition spark occurs.

3,572,303
FUEL INJECTION PUMP

Philipp Becker, Sidney, and Harlan I. Fuller, Bainbridge, N.Y., assignors to The Bendix Corporation

Filed Aug. 22, 1968, Ser. No. 754,686
Int. Cl. F02d *3/00*
U.S. Cl. 123—140 **21 Claims**

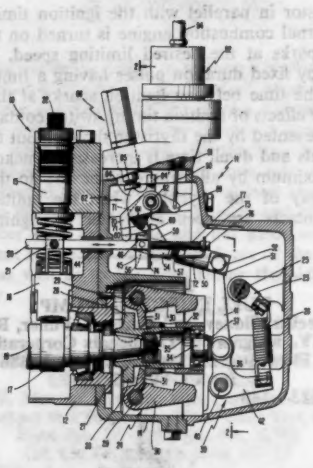


A fuel injection pump for an engine wherein the rate of fuel delivery is determined by a governor acting upon a

movable pump controlling member in opposition to a heavy spring variably tensioned by the engine throttle. The pump includes a jointed lever interposed between the movable member and the pump control rod, the jointed lever being rigid in the fuel quantity increasing direction and foldable in the other, fuel quantity-decreasing direction against the opposition of a small spring. A second, rigid lever, connected to move synchronously with the jointed lever, cooperates with a maximum fuel stop lever and a boost rack control lever. In a first disclosed embodiment, the jointed lever and the rigid lever are separate, but both are driven by the movable member. In a second disclosed embodiment, the jointed lever is formed in part of a portion of the rigid lever.

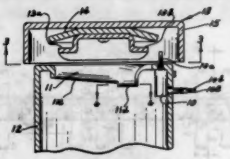
In both the first and second embodiments, provision is made for temporarily disabling the maximum fuel stop lever when the engine is to be started, so that excess fuel may be supplied to the engine. In a third disclosed embodiment, the control rod for the engine is automatically moved to its excess fuel position when the engine stops, so that the control rod of the pump is in position for the restarting of the engine.

3,572,304
FUEL INJECTION PUMP
Philipp Becker and Douglas A. Luscomb, Sidney, N.Y., assignors to The Bendix Corporation
Filed Sept. 27, 1968, Ser. No. 763,068
Int. Cl. F02d *1/04*
U.S. Cl. 123—140 **7 Claims**



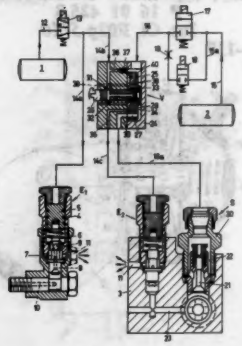
A fuel injection pump wherein the rate of fuel delivery is determined by a pump control rod which is adjusted by a governor acting upon a movable pump controlling member in opposition to a heavy spring variably tensioned by the engine throttle. The pump includes a connecting unit interposed between the pump control rod and a linkage extending from the movable member, the connecting unit having a slide which is connected to the control rod by spring means whereby the latter transmits motion from the slide to the control rod in the fuel quantity increasing direction while permitting motion of said rod in fuel decreasing direction relative to the slide. Means rigidly connected to the linkage ahead of the slide cooperates with a maximum fuel lever. Means rigidly connected to the control rod, but yieldably connected to the slide through said spring means, selectively cooperates with a fuel shut off lever and with a boost rack control lever, whereby both such latter levers need overcome only said spring means in order to move the control rod in its fuel decreasing direction. The pump is also provided with means for temporarily disabling the maximum fuel stop lever and the boost rack control lever when the engine is to be started, so that excess fuel may be supplied to the engine.

3,572,305
ENGINE IGNITION INTERRUPTING SAFETY DEVICE FOR FUEL TANK COVERS
Edward L. Moragne, 4723 Nenana, Houston, Tex. 77035
Filed May 4, 1970, Ser. No. 34,026
Int. Cl. B60k *15/04, 27/08;* F02p *11/00*
U.S. Cl. 123—146.5 **6 Claims**



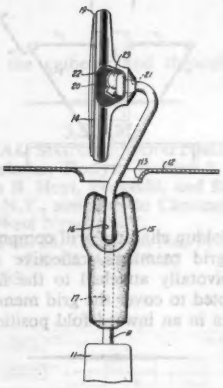
An explosion-proof microswitch is mounted in the filling pipe leading to a gasoline storage tank. A mechanical plunger extends away from the microswitch where it is adapted to be engaged by a tank cover which is removably secured to the filler pipe opening. When the gas tank cover is in its fully closed position, the plunger of the microswitch is depressed to close an electrical circuit forming a part of the ignition circuit of an internal combustion engine. When the tank cover is off or incompletely secured to the filler pipe, the microswitch contacts are open to prevent operation of the engine.

3,572,306
COMPRESSED-AIR STARTER WITH WATER DRAINAGE ARRANGEMENT
Paul Hurlimann, Zurich, Switzerland, assignor to Nova-Werke, Ferber & Wran, Zurich, Switzerland
Filed May 8, 1969, Ser. No. 823,014
Claims priority, application Switzerland, May 10, 1968, 6,989/68
Int. Cl. F01l *13/08;* F02n *17/00*
U.S. Cl. 123—179 **2 Claims**



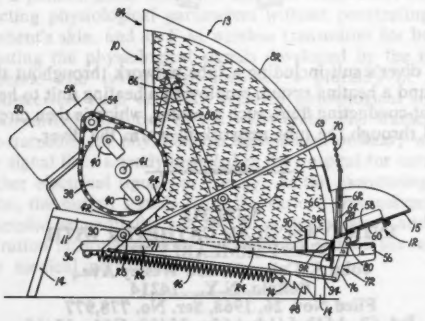
A source of air compressed at a relatively low pressure is connected to the pneumatically operated drain valves in the cylinder heads, by means of a series of special passageways in the distributor.

3,572,307
HANDLE FOR PULL ROPE ENGINE STARTER
Joseph R. Harkness, Germantown, and Gordon D. Kelly, Elm Grove, Wis., assignors to Briggs & Stratton Corportation, Wauwatosa, Wis.
Filed Jan. 27, 1969, Ser. No. 794,129
Int. Cl. A47b *95/02*
U.S. Cl. 123—185 5 Claims



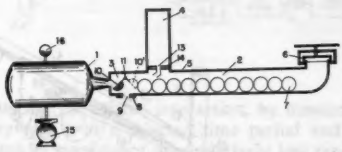
A T-shaped handle attached to the pull rope of a rewind type engine starter comprises separably nested inner and outer sections, the latter being capable of deformation into a shape permitting it to be passed through a hole only large enough to accommodate the smaller rigid inner section when the sections are separated but still connected with the rope.

3,572,308
SPRING ACTUATED CENTRIFUGAL TYPE BALL THROWING DEVICE
Leonard G. Smith, 2325 Elton Ave., Bakersfield, Calif. 93306
Filed May 15, 1969, Ser. No. 825,008
Int. Cl. F41b *3/02*
U.S. Cl. 124—7 7 Claims



A device for throwing a ball mechanically to an animal or person. The preferred embodiments of the invention include a throwing arm resiliently mounted in a housing. The housing has an inlet door and an outlet door. An electric drive motor is provided to cock the throwing arm against a spring to a position where the ball is received from the housing inlet. The housing inlet also has a weight actuated switch which senses the presence of the ball in the inlet and starts the electric motor to cock the throwing arm. After the throwing arm is cocked, it is released to the urging of the spring which rapidly drives it to an uncocked position, propelling the ball out of the housing outlet.

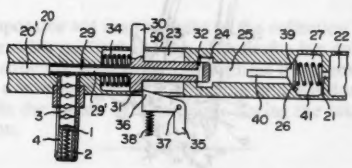
3,572,309
AIR GUN
Waldemar Teixeira de Freitas, Rua Rodrigo Silva 26, Sao Paulo, Brazil
Filed July 24, 1967, Ser. No. 655,634
Claims priority, application Brazil, July 22, 1966, 181,497
Int. Cl. F41b *11/02*
U.S. Cl. 124—11 4 Claims



Air gun for scaring birds and other undesirable creatures, comprising an elongated reservoir wherein a plurality of balls is stored and which can be pressurized. The balls are expelled one by one when the air pressure in the reservoir attains a value capable of forcing one ball through an orifice in the reservoir wall, overcoming the resisting frictional force between the orifice and the ball. Either the balls or the orifice wall can be made elastic or deformable while the other element is made relatively rigid or non-deformable.

In a portion of the reservoir, vertically aligned above said orifice, is a paddle member which is kept sideways by the jet of air which operates the gun, upon the passage of a ball through said orifice. The reservoir is associated with an auxiliary reservoir, by way of a narrow passage, for alternatively storing and delivering an amount of air which assists in forcing one ball at a time through said orifice.

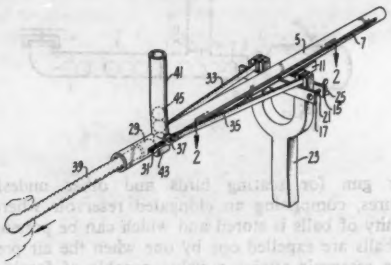
3,572,310
COMPRESSED GAS GUN AND VALVE THEREFOR
Kensuke Chiba, 8, 2-chome, Yotsuya, Shinjuku-ku, Tokyo, Japan
Filed Jan. 28, 1969, Ser. No. 794,669
Claims priority, application Japan, Feb. 2, 1968, 43/66,741; Mar. 27, 1968, 43/19,436
Int. Cl. F41b *11/06*
U.S. Cl. 124—11 6 Claims



A gas operated gun with a barrel defining a rearward extension including a widened portion accommodating a bolt and a valve. The bolt is spring urged to open the valve at the end of the extension which in turn allows compressed gas to return the bolt to a forward position. At the return position of the bolt, a gas passage extending through the bolt is opened and allows the gas to expel

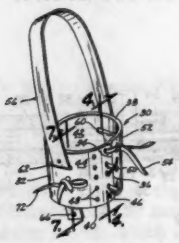
a pellet from the barrel. A magazine for the gun is an elongated container accommodating a stack of pellets, and has a resilient tongue for inserting into the housing enclosing the barrel; the tongue normally holds the topmost pellet in the magazine; but when inserted in the housing, the tongue is cammed outwardly to release the topmost pellet.

3,572,311
BOW OR SLING SHOT WITH TUBULAR DETACHABLE PROJECTILE GUIDE MEANS
Roger T. Baer, 138 McCormick St., Santa Cruz, Calif. 95060
Continuation-in-part of applications Ser. No. 696,921, Jan. 10, 1968, and Ser. No. 744,283, June 11, 1968. This application July 31, 1969, Ser. No. 857,261
Int. Cl. F41b *7/00, 15/00*
U.S. Cl. 124—20 **5 Claims**



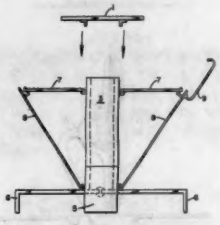
A clamp-on device which can be added to an ordinary bow or sling shot having a longitudinally slotted barrel for greater accuracy and having a magazine so that a large number of shots can be fired in quick succession. The slotted barrel has a projectile impact head member positioned in the barrel. The impact head is connected to a resilient member which abuts a projectile. When the head is cocked and released the projectile will be propelled through the barrel due to the force developed by the resilient member.

3,572,312
ARCHERY BOW WITH SLING ATTACHMENT
Merle L. Foster, 401 School, Iowa Falls, Iowa 50126
Filed Mar. 26, 1969, Ser. No. 810,478
Int. Cl. F41b *5/00*
U.S. Cl. 124—23 **6 Claims**



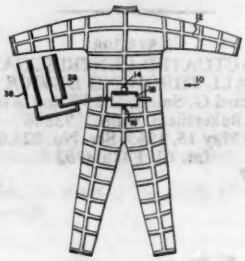
An archery bow with a sling. The sling includes an adjustable sleeve which is adapted to be detachably secured to the bow below the bow hand receiving area. An adjustable wrist strap assembly is secured to and extends upwardly and rearwardly from the sleeve and is adapted to extend over the wrist area of the shooter's bow arm to steady and stabilize the bow during the use thereof.

3,572,313
CHARCOAL COOKING "VERTA GRILL"
Louis J. Ciancaglini, 4231 SW. 41st St., West Hollywood, Fla. 33023
Filed Sept. 17, 1968, Ser. No. 761,401
Int. Cl. A47j *37/00;* **F24b** *3/00;* **F24c** *1/16*
U.S. Cl. 126—9 **1 Claim**



A portable foldup charcoal grill comprised of a vertical firebox with grid members, reflective side plates, and support legs pivotally attached to the firebox. The side plates are adapted to cover the grid members and firebox side walls when in an inward fold position.

3,572,314
HEATED DIVING SUIT
Walter Dorwin Teague, Jr., Nyack, N.Y., assignor to Columbia Gas System Service Corporation, New York, N.Y.
Filed Sept. 5, 1968, Ser. No. 757,683
Int. Cl. A61f *7/06*
U.S. Cl. 126—210 **6 Claims**

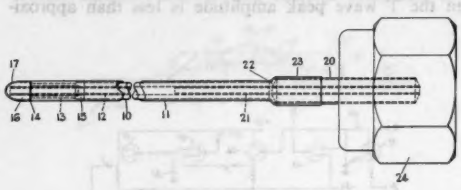


A diver's suit including a tube network throughout the suit and a heating system employing a heating unit to heat a heat-conducting fluid, such as water, which is then circulated through the tube network to warm the diver.

3,572,315
INTRAVASCULAR CATHETER WITH GAS-PERMEABLE TIP
John S. Cullen II, 138 Wesley Ave., Buffalo, N.Y. 14214
Filed Nov. 26, 1968, Ser. No. 778,977
Int. Cl. A61b *5/14;* **A65m** *25/00;* **G01n** *33/16*
U.S. Cl. 128—2 **5 Claims**

Apparatus for extracting gaseous components from a liquid for analysis. A catheter having a semi-permeable membrane at its leading end is inserted into the blood stream of a patient, the membrane being permeable to gases contained in whole blood but impermeable with respect to the blood itself. The opposite end of the catheter is connected to analysis apparatus, such as a mass

spectrometer, and subatmospheric pressure means induces gaseous flow from the blood stream through the membrane and into the catheter and through the analysis apparatus.



3,572,316

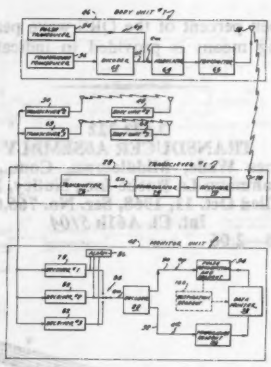
PHYSIOLOGICAL SIGNAL MONITORING SYSTEM

Joseph H. Vogelman, Roslyn, Robert S. Coe, Tuxedo Park, Kenneth B. Hoyt, Peekskill, and Bernard Feinerman, Suffern, N.Y., assignors to Chromalloy American Corporation, West Nyack, N.Y.

Filed Feb. 23, 1968, Ser. No. 707,680

Int. Cl. A61b *5/02*

U.S. Cl. 128—2.05 **14 Claims**



In one embodiment, the monitoring system is used in a hospital to transmit, to a central monitoring station, signals representing physiological parameters such as pulse rates, temperatures, and respiration rates of a number of patients located in different hospital rooms. The system includes a plurality of small units each worn on the wrist of a patient. Each wrist unit includes transducers for detecting physiological parameters without penetrating the patient's skin, and an F-M wireless transmitter for broadcasting the physiological signals developed by the transducers. The system also includes a plurality of local transceivers each of which receives physiological signals transmitted from one of the wrist units. The transceiver re-transmits the physiological signals over ordinary wiring or signal lines already installed in the hospital for carrying other electrical signals or energy. At the monitoring station, the output signals from the various transceivers are sampled sequentially, and the pulse, temperature and respiration information are displayed and printed for review by medical personnel.

3,572,317

RESPIRATORY DISTRESS MONITOR

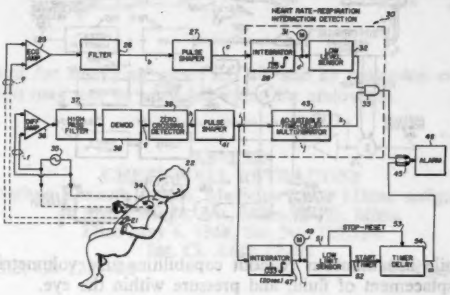
Gerald James Wade, Clifton, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Oct. 2, 1968, Ser. No. 764,448

Int. Cl. A61b *5/02, 5/08*

U.S. Cl. 128—2.05 **17 Claims**

A technique for monitoring respiratory distress in newborns by deriving electrical representations of respiratory and heart beat activity and relating the derived data to detect the presence of a condition of respiratory distress. Supplemental apparatus is used in combination with the above technique to detect a respiratory distress condition not denoted by the related interaction, by measuring the respiratory rate over a selected time period and noting the duration of persistency of a relatively low respiration rate.



3,572,318

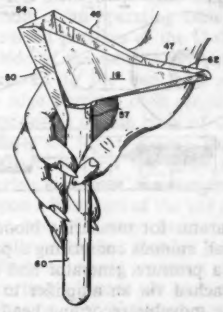
URINE SPECIMEN COLLECTION AID

Thomas N. Garland, Denver, Colo., assignor to Carol A. Wendt, Leon T. Howard, James R. Snedeker, Whitney B. Siebert, Robert F. Fiori, Robert E. Wallace, Darell W. Blair, Norman D. Paschall and Pearl M. Blakeney, fractional part interest to each

Continuation of application Ser. No. 656,229, July 26, 1967. This application Apr. 30, 1970, Ser. No. 31,843

Int. Cl. A61b *10/00;* **E03d** *13/00*

U.S. Cl. 128—2 **9 Claims**



A disposable aid used to assist in the collection of urine specimens for medical analysis. The device is a collapsible funnel structure contoured to fit against the human body, having a stabilizer flap for attaching and positioning the device in the mouth of a container during the taking of a specimen.

3,572,319

INTRAOCULAR PRESSURE CONTROL SYSTEM

Harold R. Bittner and Ray E. Digman, Silver Spring, Md., assignors to the United States of America as represented by the Secretary of Health, Education, and Welfare

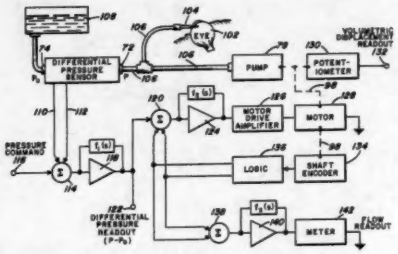
Filed May 23, 1969, Ser. No. 827,307

Int. Cl. A61b *3/16*

U.S. Cl. 128—2 **10 Claims**

A system for controlling fluid flow into or out of the eye while observing the effect on intraocular pressure.

A needle is inserted into the eye, and an accurately calibrated pressure feed system injects or withdraws the fluid,

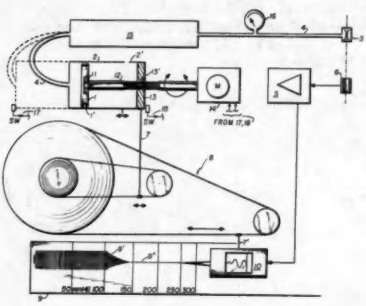


while instantaneous readout capabilities give volumetric displacement of fluid, and pressure within the eye.

3,572,320
APPARATUS FOR BLOOD PRESSURE MEASUREMENT

Marcel Gerold, Binningen, and Hansjörg Tschirky, Basel, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Apr. 26, 1968, Ser. No. 724,370
Claims priority, application Switzerland, May 12, 1967, 6,789/67
Int. Cl. A61b 5/02
U.S. Cl. 128—2.05 **7 Claims**



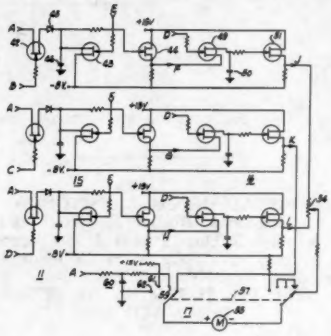
An apparatus for measuring blood pressure and heart rate in small animals comprising a pneumatic sleeve connected to a pressure generator and a piezoelectric pulse pickup attached via an amplifier to a galvanic recorder including a movable recording head, the pressure generator including a piston pump consisting of a piston and a cylinder (either the piston or the cylinder being displaceable) and a duct connecting the cylinder with the pneumatic sleeve. By way of transmission means fastened to the displaceable part of the piston pump, the recording head is synchronously displaced therewith for displacement over a recording paper for recording purposes.

3,572,321
ELECTROCARDIOMETER

Daniel K. Bloomfield, Cleveland, and Harrison A. Zieske, Mentor, Ohio, assignors to Frigitronics Inc.

Filed Apr. 1, 1969, Ser. No. 812,167
Int. Cl. A61b 5/04
U.S. Cl. 128—2.06 **18 Claims**

An electrocardiometer permits a rapid check, in the order of 15 seconds time, of the condition of a person's electrocardiogram by utilizing a single pair of leads connected across the heart to obtain the voltage of the QRS wave and the T wave. The voltages are compared and when the T wave peak amplitude is less than approxi-

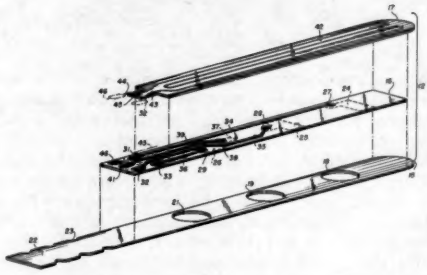


mately sixteen percent of the QRS wave peak amplitude, an indicating means is provided to indicate this faulty condition.

3,572,322
TRANSDUCER ASSEMBLY

Gerald James Wade, Middletown, Conn., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Oct. 11, 1968, Ser. No. 766,688
Int. Cl. A61b 5/04
U.S. Cl. 128—2.06 **5 Claims**



An integrated transducer assembly adapted to be held against a body surface for instrumentation-patient interface, having a flexible printed circuit member to which is bonded and electrically connected transducers for sensing physiologic functions and providing electrical output signals representative of the physiologic parameters of at least respiratory activity and heart activity.

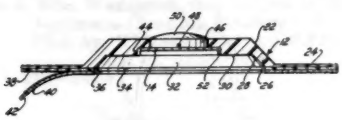
3,572,323
DISPOSABLE ELECTRODE WITH A METALLURGICALLY-BONDED, SILVER-SILVER CHLORIDE SENSING ELEMENT

Frank L. Yuan, Wayland, Mass., assignor to Becton, Dickinson and Company, East Rutherford, N.J.

Filed Jan. 3, 1969, Ser. No. 788,828
Int. Cl. A61b 5/04
U.S. Cl. 128—2.06 **6 Claims**

A disposable electrode is provided for biological and medical use comprising a sensing element housing formed

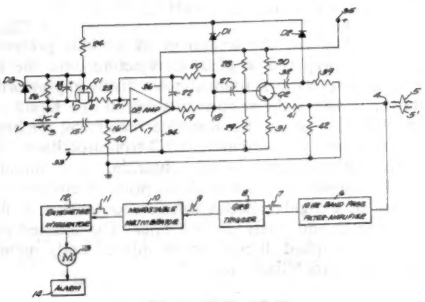
of an insulating material and having surfaces thereon adapted to receive and retain a sensing element and a sensing element. The sensing element comprises a uniformly thick flat layer of silver to which a uniformly thick flat layer of silver chloride is metallurgically bonded.



3,572,324
AUTOMATIC GAIN CONTROL FOR A CARDIAC MONITOR

Vern R. Petersen, Brookfield, Wis., assignor to General Electric Company

Filed Apr. 1, 1969, Ser. No. 812,138
Int. Cl. A61b 5/04
U.S. Cl. 128—2.06 2 Claims



Positive or negative going ECG signal waveforms are amplified in a differential-operational amplifier with negative feedback. The feedback circuit of the amplifier includes the drain-to-source path of a field effect transistor. A capacitor connected between the gate and drain has a voltage on it which automatically controls the gain of the amplifier by controlling the conductivity of the transistor. The single polarity control voltage is obtained either directly from the output of the amplifier or from an inverting transistor stage depending on whether the input signal is positive or negative. The amplifier output is held within a narrow amplitude range and is a faithful reproduction of the input signal. The output signal drives a cardiac ratemeter or other device.

3,572,325
FLEXIBLE ENDOSCOPE HAVING FLUID CONDUITS AND CONTROL

Seymour Bazell, Chicago, Ill., William E. Reynolds, Western Springs, N.J., Anatoli Brushenko, Elmhurst, and Donald A. Pontarelli, Chicago, Ill., and Bergein F. Overholt, New York, N.Y., assignors to the United States of America as represented by the Secretary of Health, Education, and Welfare

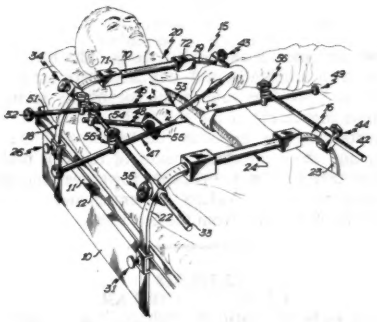
Filed Oct. 25, 1968, Ser. No. 770,537
Int. Cl. A61b 1/06, 1/30; F11l 11/18
U.S. Cl. 128—6 13 Claims

An endoscope having a flexible distal end portion comprising a distal tip and plurality of articulated segments, a less flexible central portion, a rigid proximal end, a control assembly operated at the proximal end and including control wires passing through the apparatus to the distal tip, and a fiber bundle optical system. A conduit for supplying water and air and an aspiration conduit may also be provided within the endoscope.

3,572,326
CHEST WALL RETRACTOR

Nathan Kenneth Jensen, Medicine Lake, Minn., assignor to Medic Made, Inc., Minneapolis, Minn.

Filed May 6, 1968, Ser. No. 726,734
Int. Cl. A61b 17/02
U.S. Cl. 128—20 10 Claims



A surgical retractor having a plurality of inverted U-shaped supports having their lower ends adapted to be secured to the side rails of an operating table, a pair of bars secured to the curved portions of the U-shaped supports, one on each side of the table, and retracting elements adjustably secured to the bars and adapted to engage the opposite edge portions of a surgical incision to exert counteracting forces on the body of the patient, the radius of curvature of the U-shaped supports approximating the distance between the outer extremities of the ribs and the vertebral column of a human of typical dimensions so that upon adjustment of the bar outwardly, the chest wall, in the case of a chest incision, is moved upwardly and outwardly. A pusher member may also be mounted on one of the bars to hold a portion of the body inwardly while the portion adjacent the incision is being pulled out by the retractor. The U-shaped supports each have a removable link member to permit the introduction of surgical coverings, these link members also being adapted to support a retractor or other surgical implement.

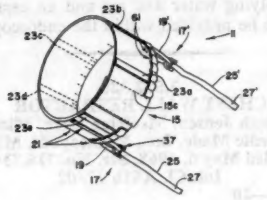
3,572,327
UNIVERSAL TRACTION BELT MEANS

Leander D. Beard and Robert J. Boggs, Memphis, and John R. Treace, Germantown, Tenn., assignors to Richards Manufacturing Company, Memphis, Tenn.

Filed July 3, 1968, Ser. No. 742,278
Int. Cl. A61h 1/02
U.S. Cl. 128—75 3 Claims

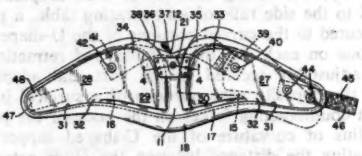
Pelvic traction belt means is disclosed which is adapted for use with existing traction weight means. The traction belt means includes a belt body having "Velcro"-type fastening means for fastening the belt body about the waist of a patient and includes bridle means adapted for interconnecting the belt body and the existing weight means.

The bridle means has at least one U-shaped strap-like yoke member having a pair of end portions adapted to be detachably engaged by "Velcro"-type fastening means to the belt body. A series of gather-like loops are arranged along the lower outside portion of said belt body and a selected pair of the loops are adapted to receive the opposite end portions of the U-shaped yoke member as the yoke member end portions are being supported by a "Velcro"-



type fastening means on the belt body. The belt body is provided with resiliently stiff stay members arranged in the body and provides reinforcing means for reinforcing the flexible movement of the belt body. A selected pair of loops embracing the opposite end portions of the yoke member and the reinforcing means of the belt body are simultaneously coactingly operative for preventing peeling disengagement of the "Velcro" fastening means and disengagement of the yoke from the belt body.

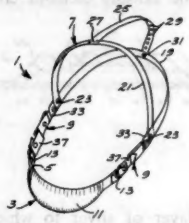
3,572,328
CERVICAL COLLAR
John L. Bond, North Wilkesboro, N.C. 28659
Filed Dec. 11, 1968, Ser. No. 782,865
Int. Cl. A61h *1/02*
U.S. Cl. 128—75 **10 Claims**



An adjustable flexible cervical collar in which laterally spaced-apart flanking sheets are secured to a front sheet with the inner ends of the flanking sheets being freely extending toward each other and the outer ends of said flanking sheets extending beyond the front sheet to form a neck-encircling collar with means on the front sheet for releasably fastening the inner ends of the flanking sheets in vertical displaced positions relative to each other and to the front sheet with means for cooperatively cradling the chin of a wearer supported by the upwardly extending sections of the flanking sheets.

3,572,329
CHIN STRAP
Irvin S. De Woskin, St. Louis, Mo., assignor to Orthoband Company, Inc., St. Louis, Mo.
Filed May 1, 1968, Ser. No. 725,720
Int. Cl. A61f *5/08*
U.S. Cl. 128—76 **8 Claims**

An adjustable chin strap for orthodontic and cosmetic use, the chin strap comprising a thermoformable plastic cup for engagement with the chin of the wearer. The cup is relatively rigid, having integral flexible straps extending from its ends for connection to adjustable elastic traction

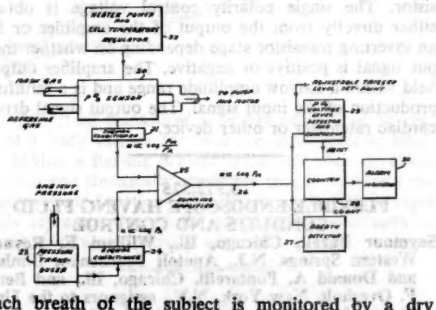


bands. These bands interconnect the cup straps with a headgear adapted to be worn on the head.

3,572,330
METHOD OF TREATING WOUNDS AND IMMOBILIZING INJURED BODY MEMBERS WITH A FOAMED RESIN
Robert J. Gander, White House, N.J., assignor to Johnson and Johnson
No Drawing. Original application Feb. 28, 1963, Ser. No. 261,824, now Patent No. 3,419,506. Divided and this application Aug. 6, 1968, Ser. No. 765,727
Int. Cl. A61f *5/04;* **A61l** *15/01, 15/07*
U.S. Cl. 128—90 **4 Claims**

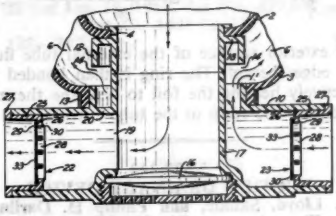
In a method for the treatment of wounds protective coatings are prepared in place by ejecting onto the surface to be protected a foamed resin from a pressurized container in which the resin is in solution in a liquid propellent of the group trichlorofluoromethane, dichlorofluoromethane, 1,1,2-trichloro-1,2,2-trifluoroethane, 1,1-difluoro-1-chloroethane, vinyl chloride, and dimethyl ether. The pressurized composition prior to ejection is in the form of a highly viscous solution suspension of film-forming resin and finely divided filler. The foamed resin can also be applied directly to an injured body member to form an immobilizing cast.

3,572,331
IMPENDING HYPOXIA DETECTION AND WARNING SYSTEM FOR AIRCRAFT PERSONNEL
Abbott T. Kissen, 1727 Parkhill Drive, Dayton, Ohio 45406
Filed June 25, 1969, Ser. No. 843,901
Int. Cl. A62b *9/00*
U.S. Cl. 128—142 **5 Claims**



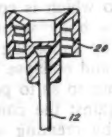
Each breath of the subject is monitored by a dry electrolyte oxygen partial pressure (pO_2) sensing cell having millisecond response characteristics. An electronic circuit responsive to the oxygen sensor counts breaths exhibiting maximal partial pressure of oxygen values below an electronically preset equivalent partial pressure of oxygen, and after a predetermined number of successive counts an alarm circuit is energized until the oxygen partial pressure rises above the predetermined level.

3,572,332
COMBINATION VALVE AND SPEAKING DIAPHRAGM UNIT
Layton A. Wise, Washington, Pa., assignor to Mine Safety Appliances Company, Pittsburgh, Pa.
Filed Apr. 29, 1969, Ser. No. 820,070
Int. Cl. A62b 7/00
U.S. Cl. 128—142.4 5 Claims



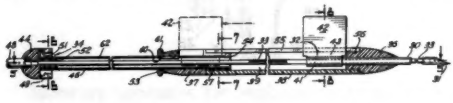
A tubular member adapted to extend across the front of a breathing mask is provided in its front and back with central openings. The back opening is formed for connection to the inlet of the mask, but a speaking diaphragm is mounted in the front opening. An exhalation tube, the front end of which is connected to the tubular member around the front opening, extends through the back opening for connection to the outlet of a nose cup in the mask. Inhalation and exhalation valves are mounted in opposite ends of the tubular member, and the portion of the exhalation tube inside that member communicates only with the exhalation valve. Inhalation is through the space between the exhalation tube and the tubular member, while exhalation is through the exhalation tube.

3,572,333
OBTURATOR
Franz H. Hubert, Carlstadt, N.J., assignor to Becton, Dickinson and Company, East Rutherford, N.J.
Filed Oct. 14, 1968, Ser. No. 767,331
Int. Cl. A61m 5/00, 25/00
U.S. Cl. 128—214.4 4 Claims



A disposable plastic obturator which is adapted to occlude the entire bore of a catheter. The obturator includes an elongated stem having an enlarged head at one end which is encapsulated in a surrounding hub. The stem and hub are assembled by initially positioning the stem head against a shoulder in the bore of the hub, and then deforming an annular lip in the hub bore to overlie the top of the stem head.

3,572,334
INTRAVENOUS CATHETER PLACEMENT UNIT
DeWitt R. Petterson, North Brunswick, N.J., assignor to Johnson & Johnson
Filed Nov. 27, 1968, Ser. No. 779,340
Int. Cl. A61m 5/00
U.S. Cl. 128—214.4 5 Claims

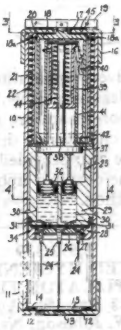


An intravenous catheter placement unit wherein the catheter passes through a hollow pointed needle which is fully retractable into a housing which holds the needle and the needle point firmly in position longitudinally and laterally with respect to the catheter so that the catheter cannot move into injurious contact with the sharp edges of the needle point. The needle is inserted into the vein or other body cavity and retracted into the housing under the direct control of the same needle control means held by the operator. In its preferred form, the catheter is connected to catheter control means comprising an elongated catheter protector mounted to slide axially in the housing to control the advancement of the catheter through the needle. When the catheter is fully advanced and the needle is fully retracted, the catheter, needle and protector all are telescoped, one inside the other, within the housing and locked in position to provide a stable unit. No parts are removed and no extra parts are needed to operate and use the unit of this invention.

3,572,335
CERVICAL IMPLANT METHOD AND DEVICE
Ralph R. Robinson, P.O. Box 668, Middlesboro, Ky. 40965
Filed Jan. 10, 1969, Ser. No. 790,272
Int. Cl. A61m 5/00
U.S. Cl. 128—217 4 Claims

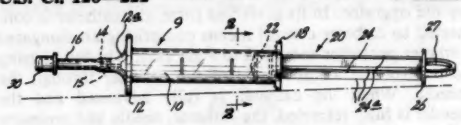
A device having an elongated outer tube housing an inner tube which presents a sharpened end exteriorly of the outer tube adapted for penetrating the tissues of the uterus, there being a plunger extending into the opposite end of the outer tube for ejecting a pointed capsule containing a diffusible contraceptive ingredient into said tissues. Stop means are provided on the device for limiting the penetration of the inner tube into the uterus.

3,572,336
SYRINGE
Daniel R. Hershberg, 72 Edgecomb St., Albany, N.Y. 12209
Filed Apr. 30, 1968, Ser. No. 725,369
Int. Cl. A61m 5/20
U.S. Cl. 128—218 21 Claims



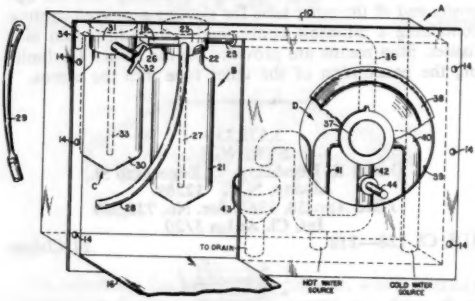
This invention is directed to an automatic syringe which includes a first spring biased subassembly for inserting a needle into a patient and also includes second spring biased subassembly for automatically injecting the fluid after the needle has been inserted.

3,572,337
SYRINGE FOR ORAL ADMINISTRATION OF MEDICINE
George J. Schunk, 3265 Azalea Drive S., Salem, Oreg. 97302
Filed Dec. 26, 1968, Ser. No. 786,923
Int. Cl. A61j 7/00
U.S. Cl. 128—222 7 Claims



A syringe for the oral administration of medicine for infants and children including an elongated hollow barrel terminating at one end in a flexible tip for insertion into the mouth. A lip abutment skirt projecting radially from the barrel is adapted to fit against the child's lips and prevent them from passing over the barrel with the syringe in place. The tip, with the syringe in place, projects within the buccal pouch. Fexibility in the tip permits it to conform to the curvature of the inside of the cheek. The tip is not so long as to reach the trachea should the tip be improperly positioned over the tongue. A removable cap fits over the flexible tip, and the syringe when rested on a horizontal surface assumes a position inclining upwardly toward the tip.

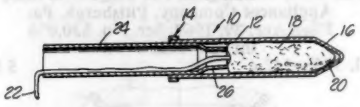
3,572,338
MIXING AND DELIVERY APPARATUS
Leo E. Murray, Jr., 2035 Main St., Fortuna, Calif. 95540
Filed Feb. 27, 1968, Ser. No. 708,654
Int. Cl. A61m 3/00
U.S. Cl. 128—229 5 Claims



A mixing and delivery apparatus including a chamber for mixing fluids, at least one of which is being introduced under pressure. Syphon means are provided in fluid communication with the chamber to deliver fluid overflowing therefrom. Means are also provided to allow for the automatic emptying of the chamber upon termination of pressurized fluid introduction.

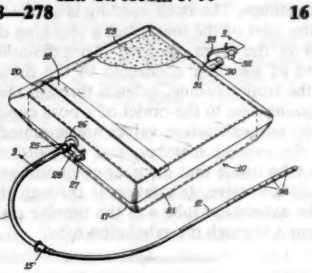
3,572,339
REINFORCED HYGIENIC MEDIUM APPLICATOR TUBES
Joseph A. Voss, 1223 Race St., Apt. 902, Denver, Colo. 80206, and Carl W. Johnson, Neenah, Wis.; said Johnson assignor to said Voss
Filed May 10, 1968, Ser. No. 728,290
Int. Cl. A61m 7/00
U.S. Cl. 128—260 9 Claims

A tubular, hygienic medium applicator device including a thin-walled, ring-reinforced external tube. The reinforcing ring is a laminated structure composed of five concentric plies including three plies of paper surrounding a ply of electrically conductive foil coated on its inner surface with a ply of thermoplastic resin material. In the fabrication of the reinforced tube, the ring is telescoped



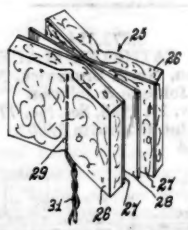
over the exterior surface of the external tube flush with the rear edge thereof. The ring is then bonded in place by inductively heating the foil to heat the thermoplastic resin and fuse the resin to the tube surface.

3,572,340
SUCTION DRAINAGE DEVICE
John K. Lloyd, Skokie, and Phillip H. Darling, Lake Zurich, Ill., assignors to The Kendall Company, Boston, Mass.
Filed Jan. 11, 1968, Ser. No. 697,074
Int. Cl. A61m 1/00
U.S. Cl. 128—278 16 Claims



A portable, disposable, sterile suction drainage device for extraction and collection of body fluids from wounds. The device includes a fluid-collecting pump unit attachable to the patient's body and comprising a resiliently compressible open-cell foam pad encased within a collapsible container, to which is connected suitable tubing for insertion into a body wound. The pump unit is activated by manually squeezing the container to compress the foam pad and collapse the container, and then releasing the container so as to permit the resilient force of the foam pad against the container walls to expand the container, thereby creating suction within the container which draws the body fluids from the wound through the tubing into the container.

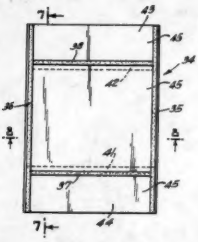
3,572,341
CATAMENIAL TAMPON
Jacob A. Glassman, 1680 Meridian Ave., Miami Beach, Fla. 33160
Filed Feb. 20, 1969, Ser. No. 800,983
Int. Cl. A61f 13/20
U.S. Cl. 128—285 2 Claims



An externally waterproofed catamenial tampon comprised of a laminated structure which is highly compressed

in its tail portion so as to resist free flow of waste fluids and including deodorant impregnated interleaves.

3,572,342
DIAPER
Julius Lindquist, Somerville, and Robert J. Trewella, North Brunswick, N.J., assignors to Johnson & Johnson
Filed Jan. 19, 1968, Ser. No. 699,097
Int. Cl. A61f 13/15
U.S. Cl. 128—287 5 Claims

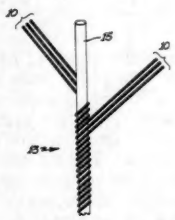


Diapers are prepared in which a seal is provided between the surface of the diaper and the body of the infant wearing the same to prevent leakage between the diaper and the infant. The seal is formed of resilient hydrophobic polymer foam which is secured to the upper surface of the diaper. By placing hydrophobic resilient strips along each side of the diaper on the surface which is adjacent the child when the diaper is in place leakage from the edge of the diaper is controlled.

3,572,343
SUTURE WITH WOUND HEALING FILAMENT
Winfred Hirsch, Plainview, N.Y., assignor to Edward Weck & Company, Inc., Long Island City, N.Y.
No Drawing. Continuation-in-part of application Ser. No. 531,768, Mar. 4, 1966. This application June 19, 1968, Ser. No. 738,098
Int. Cl. A61l 17/00
U.S. Cl. 128—335.5 14 Claims

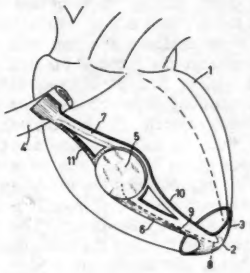
A suture and ligature material useful in accelerating the healing of wounds comprising twisted or braided filaments (a) of pure aluminum and stainless steel or (b) of pure magnesium and stainless steel filaments.

3,572,344
ELECTRODE APPARATUS WITH LEAD CONSTRUCTION
Lee R. Bolduc, St. Louis Park, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.
Filed Dec. 31, 1968, Ser. No. 788,197
Int. Cl. A61n 1/04
U.S. Cl. 128—418 8 Claims



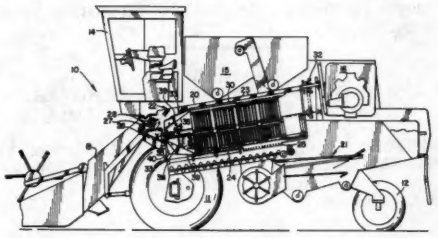
Electrode apparatus for implantation in the body and having at least one electrode at one end, and at least one electrical conductor at the other end for connection to a source of electrical signal. The electrode and conductor are interconnected by a flexible electrical conductor lead that has a nonconductive core around which are wrapped a plurality of conductor strands. Each strand comprises an electrical conductor strip wrapped around a separate non-conductive core. The strands and strips are helically wound around their respective core, and the windings are spaced one from the other.

3,572,345
STRAP FOR A HEART STIMULATOR
Michel Joseph Auphan, Neuilly, France, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Jan. 27, 1969, Ser. No. 794,065
Claims priority, application France, Feb. 28, 1968, 141,591
Int. Cl. A61h 31/00; A61n 1/36
U.S. Cl. 128—418 3 Claims



A supporting strap of a synthetic resin for fastening an oscillating heart stimulator in the human body, said strap surrounding the stimulator and being provided with prolongations, which are divided and extend in opposite directions, each pair of prolongations having their free ends interconnected for being fastened to a stationary organ and an organ moving rhythmically with the heart-beat respectively.

3,572,346
END FEED ARRANGEMENT
William H. Knapp, Davenport, Iowa, and Caroll Q. Gochanour, Moline, Ill., assignors to International Harvester Company, Chicago, Ill.
Filed Oct. 8, 1969, Ser. No. 864,847
Int. Cl. A01f 12/18
U.S. Cl. 130—27 9 Claims

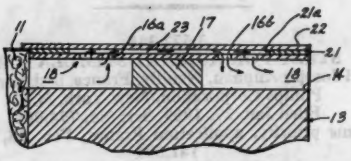


A threshing machine having an elongated threshing cylinder through which crops are axially fed. A rotor mounted within the threshing cylinder having impeller blades at the grain entry end. The impeller blades having a flat planar portion, a scoop portion including a swept back leading edge, and detachable wear members. A horizontal feed plate located at the grain entry end of the threshing cylinder at an elevation corresponding to the swept back leading edge of the impeller blades.

3,572,347
TOBACCO SMOKE FILTER

Joseph H. Sherrill, Winston-Salem, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed June 30, 1969, Ser. No. 837,668
Int. Cl. A24d 1/04; A24f 13/06, 1/16
U.S. Cl. 131—10.5 5 Claims



A filter for a cigarette is provided which includes an elongated core piece having an elongated flute formed in the exterior thereof and a first web of sheet material provided with a perforation. The first web encompasses the core piece so that the perforation is aligned and in communication with a first passageway formed by the flute. The encompassing first web carries a plastic mass which is disposed adjacent the perforation and fills a portion of the flute so as to form a smoke barrier in the first passageway. A second web of sheet material is provided which encompasses the first web; corresponding portions of the webs are disposed in spaced relation and form a second passageway. The smoke upon circulating successively through the passageways is caused to pass through the perforation at a high velocity and impinge upon a surface forming the succeeding passageway.

3,572,348
TOBACCO COMPOSITION

Vello Norman, Chapel Hill, and Thomas Blair William, Andrew George Kallianos, and James Davis Mold, Durham, N.C., assignors to Liggett & Myers Incorporated, New York, N.Y.

No Drawing. Filed Aug. 1, 1968, Ser. No. 749,324
Int. Cl. A24b 15/02
U.S. Cl. 131—17 12 Claims

A smoking preparation comprising tobacco and a zeolite material which effects a decrease in the amounts of polycyclic aromatic compounds produced from the pyrolytic reactions of tobacco, the zeolite material being of the Y-type structure, preferably at least partially exchanged with zinc ions or containing metallic palladium, or at least partially exchanged with zinc ions and containing metallic palladium, or is partially polyvalent zinc cation exchanged and partially decationized and contains metallic palladium.

3,572,349
COSMETIC APPLICATOR AND REMOVER

John Whittier Slemmons, 19142 Glen Albyn, Orange, Calif. 92667

Continuation of application Ser. No. 587,060, Oct. 17, 1966. This application May 23, 1969, Ser. No. 830,201
Int. Cl. A45d 40/26
U.S. Cl. 132—88.7 11 Claims

The application discloses a pad of material for applying cosmetic substances to the facial area, particularly around the eyes and for removing the cosmetics. The pad is capable of being divided into two portions so that eyelashes can be gripped between the portions for the effective removal of eyelash cosmetics.

3,572,350
HAIR CURLER PROTECTIVE DEVICE

Gail A. Adams and Paul B. Adams, both of 316 Cornell, Grand Forks, N. Dak. 58201

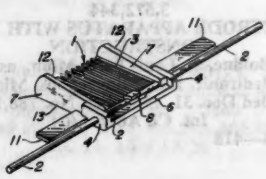
Filed Jan. 6, 1969, Ser. No. 789,325
Int. Cl. A45d 2/02
U.S. Cl. 132—39 2 Claims

The invention comprises a protective cushioning device for a hair curler, said device having a resilient C-shaped inner sleeve and a C-shaped spongeous outer sleeve attached thereto, said device being adapted to be slipped over the curler when the curler is wound onto a person's hair to provide a protective cushion between the operator's head and the curler when the operator's head is resting upon a pillow.

3,572,351
CONTROLLED COMB FOR HAIR CUTTING

Mayne A. Perry, 629 Elizabeth St., San Francisco, Calif. 94114

Filed Mar. 5, 1969, Ser. No. 804,393
Int. Cl. A45d 24/36
U.S. Cl. 132—45 6 Claims



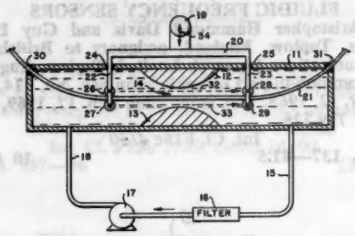
The comb controls the length of haircut so as to cut the hair to uniform length at a gradual taper. The comb is fixed on a pin or bar which is journalled in a frame. The frame has parallel sides along each end of the comb parallel with the tines of the comb, and a cross-connecting member adjacent the bar. The top edges of the sides are inclined according to the desired taper of haircutting. An abutment tongue on the bar is extended so as to abut against the adjacent cross-member of the frame and to hold the comb raised at the level of the top edges of the sides. Ears extended from the sides of the parallel frame members are finger rests when the bar is manipulated for holding the frame against the head.

3,572,352

SONIC CAVITATIONAL APPARATUS FOR CLEANING STRIPS OF MATERIAL

Dirk C. A. Koopman, La Jolla, Calif., assignor to Shell Oil Company, New York, N.Y.

Filed Oct. 24, 1968, Ser. No. 770,173
Int. Cl. B08b 3/10
U.S. Cl. 134—122 2 Claims



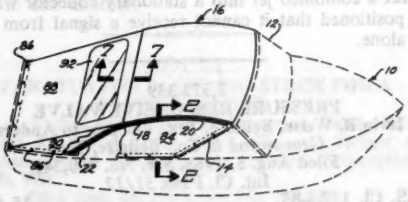
A vessel is provided with a restricted passageway therein through which strips of material and cleaning fluid are simultaneously passed as resonant vibrations are applied to the strip of material.

3,572,353

CONVERTIBLE TOPS FOR BOATS

Howard H. Pinkley, 5725 Edgewater Drive
Toledo, Ohio 43613

Filed Apr. 1, 1969, Ser. No. 811,966
Int. Cl. B63b 17/02, 19/00
U.S. Cl. 135—6 18 Claims



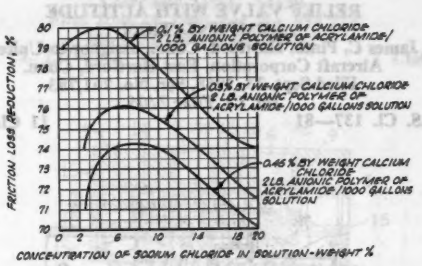
A convertible top for boats and the like having a deck or support structure surrounding a passenger compartment and preceded by a windshield. Removable side rails extend from the top side edge of the windshield over the passenger seating area, and then downwardly to the deck. A cross bar extends between the rear of the front generally horizontal portion of the side rails. Sheet material extends between the side rails, with the front end thereof secured to the windshield, and the rear end thereof secured to the cross bar. The sheet material can be slid rearwardly and gathered adjacent the cross bar, or in some instances, the cross bar and the sheet material is slid forwardly and gathered adjacent the windshield. In either case, the material is stored in an elevated position above the heads of seated passengers. The canopy may also include a second section of sheet material extending between the cross bar, and the rear of the passenger compartment. In one embodiment of the invention, the side rails can be slid downwardly and rearwardly from their normal elevated position to a position adjacent the deck to serve as hand rails.

3,572,354

METHOD OF REDUCING FRICTION LOSSES IN THE FLOW OF AQUEOUS FLUIDS

John M. Tinsley and William T. Malone, Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Nov. 21, 1969, Ser. No. 878,794
Int. Cl. F17d 1/16
U.S. Cl. 137—13 10 Claims



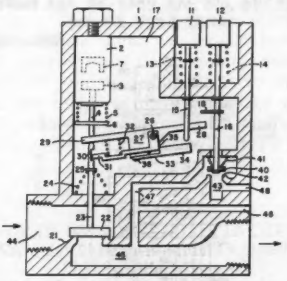
The present invention relates to an improved method of reducing friction losses in the flow of aqueous fluids containing alkaline-earth metal ions, such as the brines commonly used in fracturing oil, gas and water well formations. By the present invention quantities of a monovalent alkali metal salt and an anionic water soluble polymer of acrylamide are added to the aqueous fluid in particular amounts of each, and the resulting mixture is flowed through the conduit.

3,572,355

PUSHBUTTON OPERABLE GAS VALVE COMBINATION

Nico Van der Linden, Emmen, Netherlands, assignor to Honeywell Inc., Minneapolis, Minn.

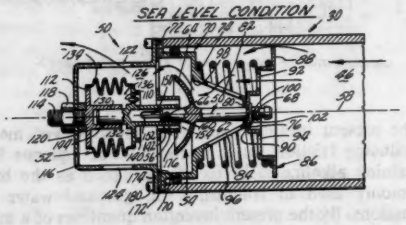
Filed Dec. 13, 1968, Ser. No. 783,679
Claims priority, application Germany, Mar. 30, 1968, P 17 78 129.2
Int. Cl. F23n 5/10
U.S. Cl. 137—66 9 Claims



A safety gas valve of the type using a thermocouple, heated by a pilot burner, to energize a magnet that is adapted to hold a valve in its open position but is incapable of opening the valve. The valve is manually opened by a first plunger acting upon a pair of latch-together levers which operably engage the valve. A second manually operable plunger is arranged to unlatch the levers to permit the valve to be biased to its closed position. The parts are so arranged that the valve cannot again be moved to its open position until the magnet is deenergized. The safety valve controls gas flow not

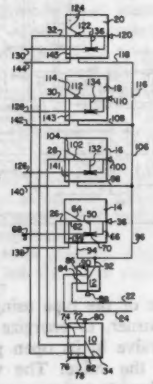
only to a main burner but to a pilot burner and a controller valve which, in turn, controls gas flow to a pressure operated valve in series with the safety valve. The first plunger operates an interrupter valve in series with the controller valve to prevent gas flow to the pressure operated valve during the resetting operation of the safety valve.

3,572,356
RELIEF VALVE WITH ALTITUDE COMPENSATION
James C. Pinto, Hartford, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.
Filed Sept. 23, 1968, Ser. No. 761,783
Int. Cl. F02c 7/06
U.S. Cl. 137—81 **11 Claims**



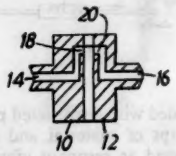
A relief valve of the pressure responsive poppet type which is connected to an altitude responsive bellows so as to be held open by the collapsed bellows at sea level and so as to be divorced from the operation of the bellows and act as a true pressure responsive poppet valve independent of the bellows during altitude operation.

3,572,357
ENGINE MONITORING SYSTEM EMPLOYING FLUIDIC CIRCUITRY
Daniel W. Philbrick, Phoenixville, Pa., assignor to Robertshaw Controls Company, Richmond, Va.
Filed Dec. 10, 1968, Ser. No. 782,695
Int. Cl. F15c 1/12
U.S. Cl. 137—81.5 **10 Claims**



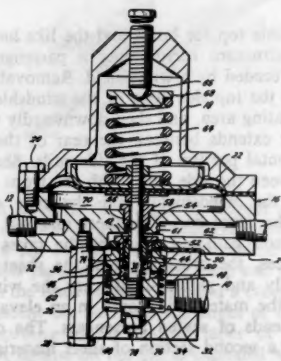
A monitoring system employing interconnected fluidic logic elements operatively associated with a plurality of pneumatic transmitters that sense the condition of safety parameters of a gas engine. Logic elements include a first and second fluidic amplifier and a series of fluidic sensors using the back pressure principle to selectively deflect a power stream between two output channels. The first amplifier combines the outputs of the series of sensors into a single output signal, while the second amplifier enables lock-out signals to be imposed on the circuit.

3,572,358
FLUIDIC FREQUENCY SENSORS
John Christopher Hammond Davis and Guy Edward Davies, Taplow, England, assignors to British Telecommunications Research Limited, Taplow, England
Continuation-in-part of application Ser. No. 774,924, Nov. 12, 1968. This application Feb. 17, 1969, Ser. No. 799,725
Int. Cl. F15c 4/00
U.S. Cl. 137—81.5 **10 Claims**



Apparatus for determining the difference between the speeds of rotation of two bodies or between the frequencies of two pressure signals comprises means for producing a jet of fluid arranged to rotate in phase with one of the bodies or one of the pressure signals. Either a receiver or a second jet of fluid is arranged to rotate in phase with the other body or pressure signal. In the case of the rotating receiver, an output pulse is produced by the receiver when it is in alignment with the jet and this occurs once during each relative rotation period. In the case of the second rotating jet of fluid, the two jets are arranged to interact once during each rotation period and, when interacting, to direct a combined jet into a stationary collector which is so positioned that it cannot receive a signal from either jet alone.

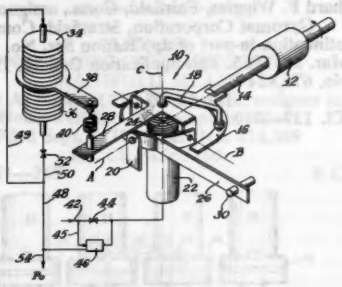
3,572,359
PRESSURE RESPONSIVE VALVE
Irvin B. Weise, Bellaire, Tex., assignor to Anderson, Greenwood & Co., Bellaire, Tex.
Filed Aug. 5, 1968, Ser. No. 750,349
Int. Cl. F16k 31/12
U.S. Cl. 137—85 **15 Claims**



An improved pilot valve having a discharge valve seat, a movable inlet valve seat which is connected to pressure responsive members, and a valve member adapted to

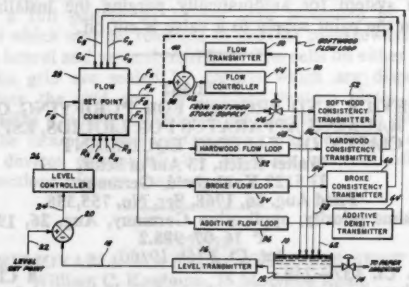
engage both seats, wherein movement of the inlet valve seat affects the unseating of the valve member from only one of said valve seats at a time so that fluid flows through the pilot valve only when the controlled pressure between the valve seats is being changed. This abstract is neither intended to define the invention of the application which, of course, is measured by the claims, nor is it intended to be limiting as to the scope of the invention in any way.

3,572,360
PNEUMATIC CONTROLLER
Sheldon G. Lloyd and Jerry B. Trottmann, Marshalltown, Iowa, assignors to Fisher Governor Company
Filed July 25, 1969, Ser. No. 845,023
Int. Cl. F15b *5/00*; G05d *16/00*
U.S. Cl. 137—86 **13 Claims**



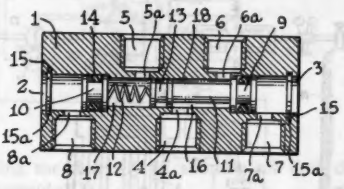
A pneumatic controller comprising a gimbal assembly having first and second levers each pivotal about an axis. A flapper rotatable about the axis of the first lever cooperates with a nozzle rotatable adjustably about a third axis. The three axes are arranged substantially at right angles to one another.

3,572,361
APPARATUS FOR BLENDING STOCK FOR A PAPER MACHINE
Robert J. Terhar and Ronald E. Knoerzer, Beloit, Wis., Marion A. Keyes, South Beloit, Ill., and Robert A. Beachler, Beloit, Wis., assignors to Beloit Corporation, Beloit, Wis.
Filed Aug. 28, 1968, Ser. No. 755,904
Int. Cl. G05d *11/035*
U.S. Cl. 137—92 **5 Claims**



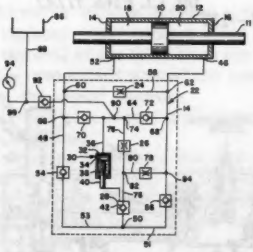
An apparatus in which a plurality of stock materials are blended to provide the furnish to a paper machine. A consistency measuring device for each stock material along with a level controller for the furnish blending tank provide signals to a computer which determines desired flow rates for the various stocks. Controllers then regulate the flow rate to the blending tank for each stock in response to the computed flow rate.

3,572,362
SELF-RECIPROCATING FOUR-WAY VALVE
Richard S. Pauliukonis, 6660 Greenbriar Drive, Cleveland, Ohio 44130
Filed June 19, 1969, Ser. No. 834,774
Int. Cl. F15b *11/08, 13/042*
U.S. Cl. 137—102 **1 Claim**



A four-way valve accomplishes reciprocating action for a sequential cylinder feeding and exhaust by the working fluid supplied. The working fluid pressure exerts a force upon the surfaces of the internally moving parts of the valve, and facilitates their shift in a self-regulated fashion when force outbalance permits, and independent of external means. The moving parts within said valve proper comprise a sleeve of dual piston construction provided with seals and interconnected through an elastic link with a free floating piston, all responsive to the pressure affect of the working fluid, and instrumental in the sequential return of the moving parts to the original position, facilitating a self-reciprocating action of the four-way valve, subject to the present invention.

3,572,363
FLUID FLOW CONTROL DEVICE
Donald E. Roach, Port Huron, Mich., assignor to McDowell-Wellman Engineering Company, Cleveland, Ohio
Filed Apr. 25, 1969, Ser. No. 819,183
Int. Cl. F16d *57/00*
U.S. Cl. 137—109 **18 Claims**



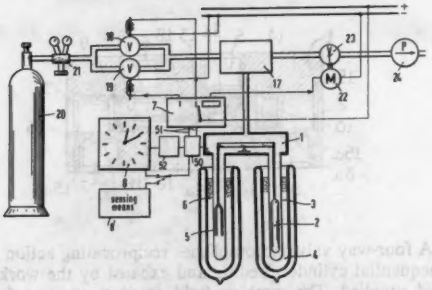
There is provided a fluid flow control device which is particularly useful in hydraulic shock absorber or damping devices and characterized by a circuit attachable to a system where fluid moves under pressure in either of two directions. This circuit includes a pair of constrictions of considerably different resistance to fluid flow in parallel with each other. By-pass means are provided in conjunction with one constriction which functions to render the other constriction inoperative when predetermined pressure conditions exist.

3,572,364

APPARATUS FOR THE MEASUREMENT, AUTOMATIC CONTROL AND PROGRAM CONTROL OF THE GAS PRESSURE IN A RECEIVER

Erich Robens and Gerd Sandstede, Frankfurt am Main, and Reinhard Theodor Gast, Berlin, Germany, assignors to Sartorius Werke G.m.b.H., Gottingen, Germany

Filed Apr. 11, 1968, Ser. No. 720,734
Claims priority, application Germany, Apr. 12, 1967, S 109,298; Apr. 13, 1967, S 109,306
Int. Cl. G05d *11/00*; G01l *7/00*
U.S. Cl. 137—110 12 Claims



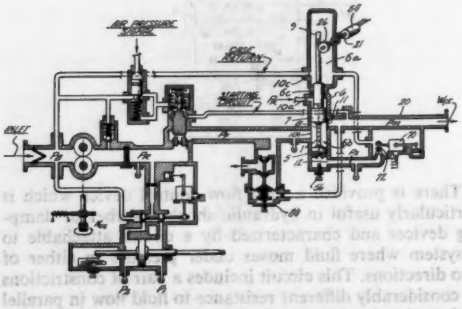
An electronic vacuum microbalance system comprises a lift-producing member which is responsive to the gas pressure in a gas receiver and a pressure-setting stepping mechanism to control the capacity of said microbalance system. A pulse generator is connected to said stepping mechanism and operable to initiate stepping movements of said mechanism. A control system establishes and maintains in the receiver a pressure which corresponds to the setting of said stepping mechanism and includes gas valve means adapted to control the gas pressure in said receiver and an electric controller operatively connected to the microbalance system and to the gas valve means and adapted to control the gas valve means in response to the output of the microbalance system.

3,572,365

MAIN FUEL METERING VALVE

Albert H. White, Wethersfield, Conn., assignor to Chandler Evans, Inc., West Hartford, Conn.

Filed May 19, 1969, Ser. No. 825,548
Int. Cl. F16k *31/42*
U.S. Cl. 137—117 6 Claims



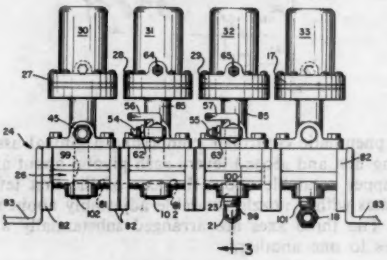
A main metering valve for a fuel system having a spool including first and second spaced lands slideably mounted in a housing. A bore, containing a restriction, passes through the spool and the lands to communicate fuel, of a regulated pressure, adjacent the outboard face of the first land, to the outboard face of the second land. The pressure of the communicated fuel adjacent the outboard face of the second land is controlled by a torque motor. An inlet port, located intermediate the lands, admits fuel from a segment of a main fuel supply line which flows outwardly from an outlet port adapted to be partially covered by the first land. A feedback potentiometer sends a signal which is compared with an input command signal for generating an error signal to the torque motor. A constant differential pressure is maintained between the inlet and outlet ports so that fuel flow is a function of spool position.

3,572,366

CONTROL VALVES FOR SUPPLYING PAINT IN PAINT SPRAY INSTALLATIONS

Richard F. Wiggins, Fairfield, Conn., assignor to The Gyromat Corporation, Stratfield, Conn.

Continuation-in-part of application Ser. No. 440,736, Mar. 18, 1965. This application Oct. 20, 1967, Ser. No. 676,824
Int. Cl. F16k *51/00*
U.S. Cl. 137—240 3 Claims



This invention is concerned with control valves for supplying paint to paint spray installations utilizing a plurality of different color paints. The control valve may be adapted to various systems by utilizing a disclosed flow housing which forms an elongated flow passageway when a number of valves are assembled. The control valve may also be adapted to recirculate paint during periods of valve inactivity to prevent clogging due to the solidification of stagnant paint. The control valve of the invention includes structural innovations, such as manual means for activating a disabled valve. The invention is also directed to a system for automatically purging the installation when the paint supply to a valve is cut off.

3,572,367

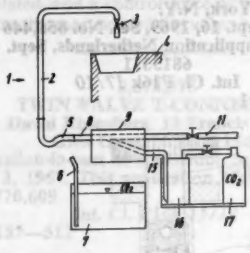
DEVICE AND PROCESS FOR PURIFYING OR RACKING APPARATUS FOR LIQUIDS, ESPECIALLY OF TAPPING EQUIPMENT

Walter Reich, 13 Auf'm Schif, D 5122 Kohlscheid, Germany

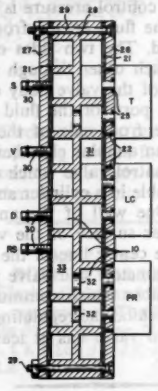
Filed Aug. 26, 1968, Ser. No. 755,358
Claims priority, application Germany, Aug. 26, 1967, P 16 07 988.2
Int. Cl. F16k *19/00*
U.S. Cl. 137—240 8 Claims

There is disclosed a method of purifying and flushing a beverage dispensing tap line involving alternately connecting the line with the beverage source or a purifier and flushing line connection, and when so connected with the last mentioned line controlling it to deliver into the tap line a purifying medium through an aspirating action,

or by gas pressure action, followed by a cutting off of purifier introduction and resorting solely to a flushing action. Several embodiments of devices for practicing this method are disclosed.



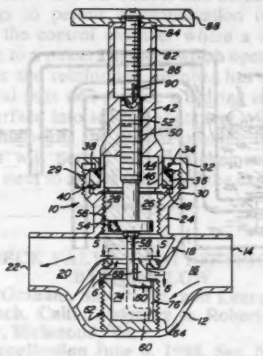
3,572,368
PNEUMATIC CONTROL SYSTEM MANIFOLD MEANS
Frank A. Bullmer, Des Plaines, Ill., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Sept. 2, 1969, Ser. No. 854,389
Int. Cl. F15c *1/06*
U.S. Cl. 137—269 **8 Claims**



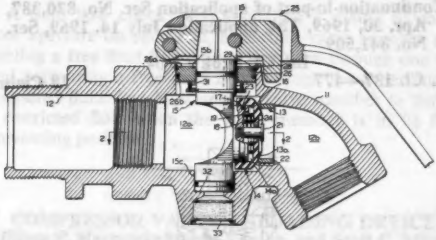
A pneumatic control system manifold assembly for the mounting and interconnecting of pneumatic control devices comprising a waffle-like grid, gaskets, a top plate, a bottom plate and connectors. The grid has on either face a full pattern of hollow cells separated by thin walls which may be removed to provide passageways for both lateral and vertical fluid flow. The cells on either side of the grid are sealed by gaskets which are disposed between the grid and the top and bottom plates thus providing a simple, inexpensive and highly flexible means for the mounting and interconnection of pneumatic control devices eliminating the need for external tubing connections between the devices.

3,572,369
REMOVABLE SEAT ENGAGING ELEMENT
William C. Kaufman, 35 Moredon Road, Philadelphia, Pa. 19115
Filed Feb. 7, 1969, Ser. No. 797,474
Int. Cl. F16k *1/44, 43/00*
U.S. Cl. 137—315 **10 Claims**

A valve is disclosed which permits a sealing element on a flow control member, such as a washer, to be removed for repair or replacement while allowing flow between the inlet and outlet chambers of the valve, thereby preventing the necessity of shutting off flow during such replacement.



3,572,370
BALL TYPE VALVE
Thomas H. Engle, Cape Vincent, N.Y., assignor to General Signal Corporation
Filed Oct. 16, 1969, Ser. No. 866,966
Int. Cl. F16k *5/20*
U.S. Cl. 137—315 **8 Claims**



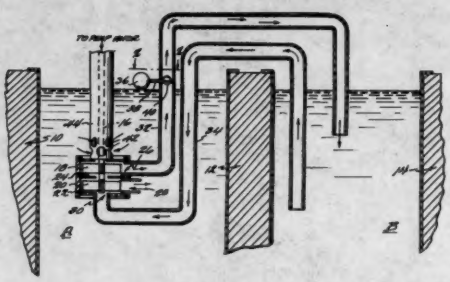
Ball type valve particularly suited for use as an angle cock in railway air brake systems. The valve is characterized in that the spherical head:

(a) is the deformable valving element subject to wear and can be replaced easily without using special tools or requiring removal of the valve from the line;
(b) is uniformly compressed around the zone of contact with the seat in the closed position;
(c) may be balanced with respect to the pressures at both sides of the seat; and
(d) translates along its own centerline and pivots about an axis eccentric to the center of the seat so that it rotates on the seat for an initial phase of its opening movement and separates from the seat during the final phase of such movement.

3,572,371
TEMPERATURE CONTROL SYSTEM FOR A LIQUID BATH
Richard L. Bergen, Marietta, Ohio, assignor to Forma Scientific, Inc., Marietta, Ohio
Filed Jan. 6, 1969, Ser. No. 789,231
Int. Cl. F16k *33/00*; F28d *7/00*
U.S. Cl. 137—398 **14 Claims**

An arrangement for precisely controlling the temperature of a bath. A heat exchanger tank is positioned adja-

cent the bath. A double pump is immersed in temperature-controlled liquid within the tank. One pump is of the suction type, and the other is a pressure pump. An open-ended conduit extends from each of the pumps into the



bath such that as the pumps are driven, liquid circulates between the tank and the bath. A level control device in the tank maintains its volume constant. In this manner the temperature of the liquid in both the tank and the bath is controlled.

3,572,372

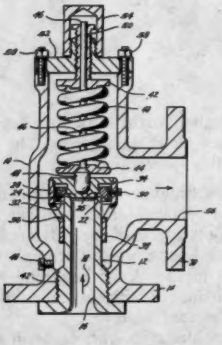
ADJUSTABLE SAFETY RELIEF VALVE

Richard S. Moore, Houston, Tex., assignor to Sage Fabricating, Inc., doing business as Sage Engineering and Valve Company, Houston, Tex.

Continuation-in-part of application Ser. No. 820,387, Apr. 30, 1969. This application July 14, 1969, Ser. No. 841,509

Int. Cl. F16k *17/04*

U.S. Cl. 137—477 **18 Claims**



An improved safety relief valve of the type having a housing defining an enclosure for the valve; a cylindrical orifice member secured at one end to and within the housing for fluid communication with a vessel the pressure of which is to be regulated, said orifice member having an axial bore for flow of fluid therethrough; a disk coaxial with the orifice member for normal sealing engagement therewith; a perforated sleeve secured to the disk for guiding the disk about the orifice member; and spring means operatively associated with the disk to maintain it in normal sealing relation with the orifice member but yieldable to unseat the disk upon exposure of the disk to a predetermined pressure from the vessel.

3,572,373

PRESSURE-REGULATING VALVE

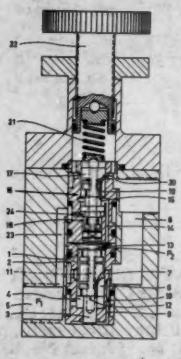
Hillebrand Johannes Josephus Kraakman, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 16, 1969, Ser. No. 858,446

Claims priority, application Netherlands, Sept. 18, 1968, 6813311

Int. Cl. F16k *17/10*

U.S. Cl. 137—491 **2 Claims**



A pressure-regulating valve for a hydraulic medium in which a valve body is axially movable in a cylinder. Fluid is active on the front side of the valve body and fluid having an adjustable control pressure is active on the rear side of the valve. The fluid on the front side is the medium to be regulated. The two sides of the valve body communicate with each other through a restriction. The outer circumference of the valve body comprises at least one adjustable outlet port for the fluid with the pressure to be regulated. The front side of the regulating valve communicates with an annular chamber which is formed in a spring-loaded control valve which comprises at least two valve parts movable in a cylinder and having different outside diameters. One wall of the annular chamber is formed by an annular surface of the valve part situated at right angles to the center line of the valve and having the larger outside diameter, said valve part comprising a further annular chamber which communicates through a duct with the space behind the regulating valve. The outer circumference of said valve has at least one outlet port of a controllable size.

3,572,374

PRESSURE-REGULATING VALVE

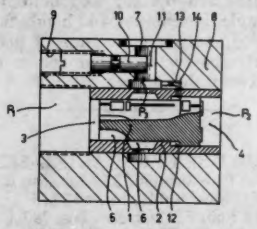
Hillebrand Johannes Josephus Kraakman, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 16, 1969, Ser. No. 858,424

Claims priority, application Netherlands, Sept. 18, 1968, 6813308

Int. Cl. G05d *16/00*

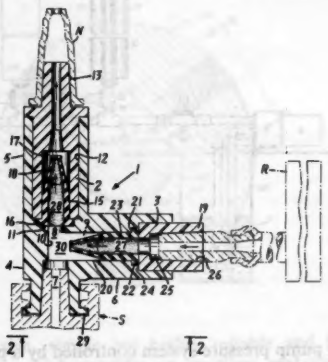
U.S. Cl. 137—494 **5 Claims**



The invention relates to a pressure-regulating valve to adjust at a desirable value a pressure of a hydraulic medium to be regulated, said valve comprising a valve body,

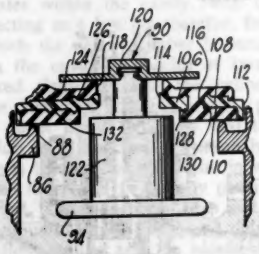
which is axially movable in a cylinder, the space in the cylinder on the front side of the valve body communicating with the hydraulic medium the pressure of which is to be regulated, and a control force of an adjustable value acting upon the rear side of the valve body.

3,572,375
TWIN VALVE T-CONNECTOR
David Rosenberg, 12 Francis Court, Glen Cove, N.Y. 11542
Continuation-in-part of application Ser. No. 643,083, June 2, 1967. This application Mar. 5, 1968, Ser. No. 710,609
Int. Cl. F16k *15/14*
U.S. Cl. 137—512 **17 Claims**



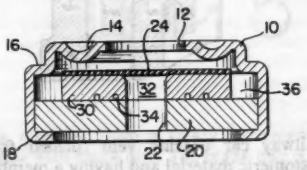
A twin valve T-connector is provided, for use with syringes and like injecting devices for use in the administration of medicaments, to supply or withdraw fluids in a volume greater than the capacity of the syringe.

3,572,376
POPPET VALVE
Gunther Pfeifer, Elyria, Ohio, and Richard H. Rosback, South Bend, Ind., assignors to The Bendix Corporation
Filed July 31, 1968, Ser. No. 749,093
Int. Cl. F16k *15/18, 17/04*
U.S. Cl. 137—512.2 **5 Claims**



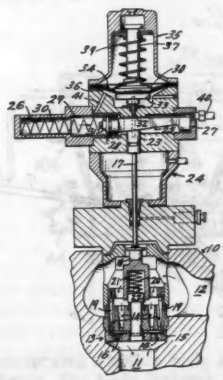
A poppet valve for a servomotor in a power braking system. The valve stem of the poppet valve has a small diameter which loosely extends through an opening in the housing connecting the control chamber with the atmospheric chamber. A disc-shaped reinforced member has a central opening loosely surrounding the valve stem. A peripheral skirt encloses a rubber material attached to the inner and outer surfaces of the reinforcing member. A cap member attached to the valve stem permits a spring operatively connected to a flange section of the stem to seat the cap member on the reinforcing member while the reinforcing member is seated on the opening in the housing. Upon application and release of the brakes, the valve stem will correspondingly move the reinforcing member with the rubber-like surfaces away from the openings to permit communication of atmospheric pressure to the control chamber where a conduit carries this pressure to a power chamber which operates the servomotor. After the reinforcing member has been unseated, the peripheral skirt will provide a bearing surface to guide the inner surface into seating alignment with the opening in the housing while the central opening in the reinforcing member will permit lateral movement with respect to the valve stem to assure seating of the cap member.

3,572,377
CHECK VALVE WITH RESTRICTED BYPASS FLOW
Marvin M. Graham, San Pedro, and Lauren D. Haskins, Long Beach, Calif., assignors to Robertshaw Controls Company, Richmond, Va.
Original application June 6, 1968, Ser. No. 734,926. Divided and this application Mar. 12, 1970, Ser. No. 18,860
Int. Cl. F16k *15/02*
U.S. Cl. 137—513.7 **8 Claims**



A fluid flow check valve including a casing having a flow aperture on each end, a floating valve member preventing a free fluid flow in one direction through one end and permitting a free fluid flow through the other end; a restricted fluid flow bypasses the valve member to permit a restricted flow when the valve member is in its flow preventing position.

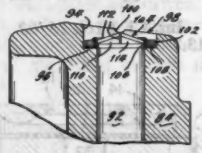
3,572,378
COMPRESSOR VALVE UNLOADING DEVICE
William F. Hartwick, Mount Vernon, and Scott C. Mickle, Fredericktown, Ohio, assignors to Cooper Industries, Inc., Mount Vernon, Ohio
Filed Jan. 5, 1970, Ser. No. 644
Int. Cl. F16k *31/524*
U.S. Cl. 137—523 **9 Claims**



A suction valve unloader for reciprocating compressors to selectively hold open the suction valves to unload the

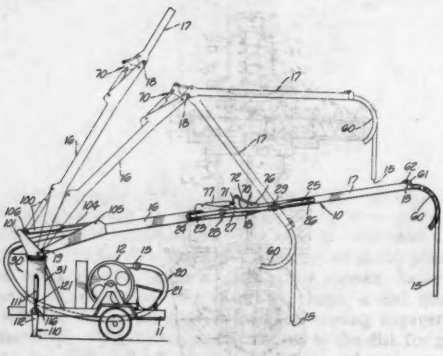
compressor. The device includes an unloader pin mechanically biased to force open and hold the suction valve and a mechanically biased wedge for locking the pin in this position to resist fluid forces against the valve held in open position. Control air pressure is used to move the wedge to unlocked position and to raise the unloader pin so that the valves may resume normal operation. In a preferred embodiment, failure of the control air pressure will cause the unloader pin to assume its locked position to unload the compressor.

3,572,379
BEARING VENT CONSTRUCTION AND PROCESS OF MANUFACTURING THE SAME
Emil J. Popa and Dennis Lee Otto, Canton, Ohio, assignors to The Timken Company, Canton, Ohio
Continuation-in-part of application Ser. No. 592,612, Nov. 7, 1966. This application Feb. 19, 1969, Ser. No. 814,872
Int. Cl. F16k *15/00*; F16c *33/78*
U.S. Cl. 137—525.1 **15 Claims**



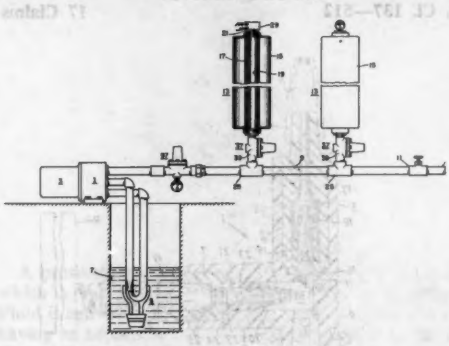
A railway car bearing vent formed from a moldable elastomeric material and having a membrane through which a hot knife is passed to form slits therein. The hot knife overcures the material in contact with it so that the edges of the slits will not rebond during operation. Thus, pressure changes in the bearing during and after operation are relieved without allowing the entry of foreign matter into the bearing or without interfering with proper lubrication of the bearing assembly.

3,572,380
CONCRETE PUMP BOOM
Robert E. Jackson, Newport Beach, and Raymond E. Decker, Riverside, Calif., assignors to Challenge-Cook Bros., Incorporated, City of Industry, Calif.
Filed Oct. 8, 1968, Ser. No. 765,782
Int. Cl. B67d *5/36, 5/60, 5/64*
U.S. Cl. 137—565 **16 Claims**



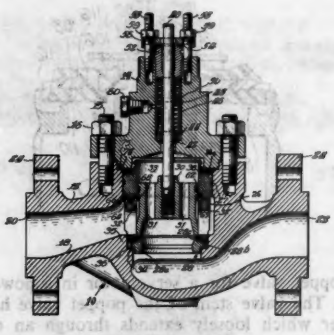
An articulated and hydraulically operated boom includes pivotally connected boom segments to support a conduit which communicates concrete pumped from a concrete pump to any selected location above and below ground level within a predetermined radius. One of the boom segments is pivotally and rotatably secured to a portable chassis which includes a plurality of outriggers to provide stability during the pumping operation.

3,572,381
PUMP PRESSURE SYSTEM
Floyd M. Nash, Little Rock, Ark., assignor to Jacuzzi Bros. Incorporated
Filed May 26, 1969, Ser. No. 827,855
Int. Cl. E03b *11/16*; F04b *49/08*
U.S. Cl. 137—568 **5 Claims**



A pump pressure system controlled by a pressure switch to establish a pressure range of operation, has its pressure tank or equivalent, valve controlled to open for filling, at approximately the maximum pressure of said pressure range, whereby to minimize cycling operations of the pump, while at the same time, improving pressure delivery to service.

3,572,382
SINGLE-PORTED DOUBLE-SEATED VALVE MECHANISM
Fred J. Luthe, 102 Columbus Drive, Marshalltown, Iowa 50158
Filed Jan. 31, 1969, Ser. No. 795,496
Int. Cl. F16k *39/02*
U.S. Cl. 137—625.35 **13 Claims**



A single-ported double-seated valve mechanism including a valve plug adapted to engage a first valve seat for terminating fluid flow through a flow passage in a valve body means and second valve seat means cooperating with the valve plug to seal only when the valve plug

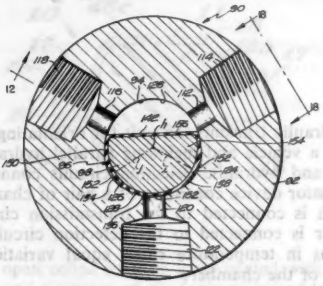
is in the closed position against the first valve seat means. The valve mechanism is designed so that no seat-to-seat spacing adjustments are required, there is no sliding seal friction of the second seat means against the valve plug to adversely affect the positioning of the valve plug, a minimum of stem force is needed to shut off the valve plug bubble-tight and the valve seat means can be readily replaced.

3,572,383

PLUG VALVE WITH RESILIENT AND DEFORMABLE PERIPHERAL LOBES ON VALVE MEMBER

Angelo Natalizia, Smithfield, R.I., assignor to Grinnell Corporation, Providence, R.I.

Filed Sept. 13, 1968, Ser. No. 759,548
Int. Cl. F16k *5/04, 5/18*
U.S. Cl. 137—625.47 **24 Claims**



An inexpensive, simple but highly reliable and long life plug valve, which provides an excellent seal and is highly resistant to leakage even at sustained high temperatures but which is quite easy to turn, comprising a valve body, which has a generally cylindrical cavity with circumferentially spaced inlet and outlet ports and one or more circumferentially spaced longitudinal recesses or reliefs in the peripheral wall thereof, and a generally cylindrical valve member of a resilient and deformable material having a rigid stem embedded therein and one or more longitudinally extending resilient and deformable peripheral lobes. The peripheral cavity wall peripherally encloses the valve member and both are generally coaxial. The width, length and depth of the elongated recesses or reliefs are at least as great as the width, length and depth of the elongated lobes. The valve member rotates within the cavity, with the peripheral cavity wall acting as a bearing therefor, from a first position, in which the valve member is compressed laterally between the cavity wall with at least one of the lobes squeezed tightly against the cylindrical portion (seat) of the cavity wall around a port (preferably the downstream outlet port) to tightly seal the port, to a second position in which communication is provided between the ports through the valve and in which the lobe is rotated into the recess to thereby permit the lobe to become relaxed. The lobe peripheries and floors of the recesses are arcuate. The resilient and deformable lobes provide excellent sealing and the recesses for receiving the lobes facilitate assembling and turning of the valve member and minimize wear.

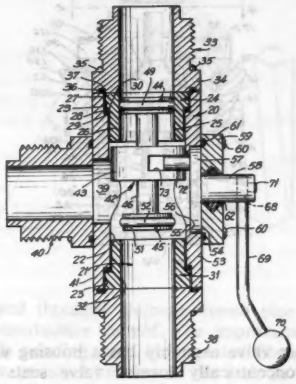
3,572,384

TWO-WAY VACUUM VALVES

Ivor John Taylor, 560 Riverside Drive, Apt. 6G, New York, N.Y. 10027

Filed June 20, 1968, Ser. No. 738,513
Int. Cl. F16k *11/02*
U.S. Cl. 137—625.5 **8 Claims**

The invention relates to two-way valves of a type suitable for use in high vacuum systems. A double acting piston element reciprocates in a cylindrical bore of the valve casing. The piston element has reduced diameter shank portions and O-rings contained within end discs. This shape permits optimum pumping speed through the valve. The piston forms a vacuum seal within detachable end sleeves withdrawable from the valve casing, the sleeve construction enabling high quality vacuum sealing under conditions of extensive use. Reciprocal motion of the piston element is obtained from a rotary movement of an actuating spindle with crank disc. The crank disc is located within a recess in the valve casing to allow absorption of operating stresses by the valve casing and permit the construction of an efficient vacuum sealing arrangement for the spindle. A crank pin and external stops system enables locking of the valve in its operating positions, and an arrangement permitting locking in an intermediate operating position (with all ports mutually closed) is also presented.

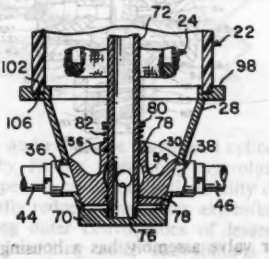


3,572,385

VALVE

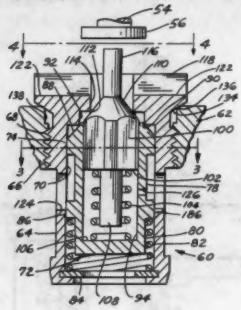
William A. Acosta, 5160 Butler Pike, Lafayette Hill, Pa. 19444

Original application Apr. 15, 1966, Ser. No. 542,835, now Patent No. 3,421,630. Divided and this application Sept. 18, 1968, Ser. No. 760,498
Int. Cl. F16k *11/02*
U.S. Cl. 137—625.47 **4 Claims**



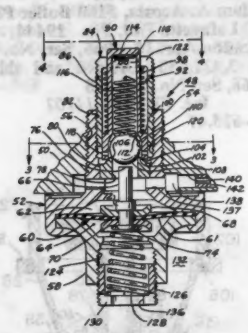
A valve comprising a hollow body and a plug rotatably mounted therein. The body includes at least two spaced ports. The plug includes two spaced channels which are rotatable into and out of alignment with said ports for opening and closing the valve.

3,572,386
MULTI-STAGE POWER VALVE ASSEMBLY
Harry A. Sherwin, 11724 Amel Drive, Warren, Mich. 48093
Filed Dec. 13, 1968, Ser. No. 783,562
Int. Cl. F16k *11/14*
U.S. Cl. 137—630.22 3 Claims



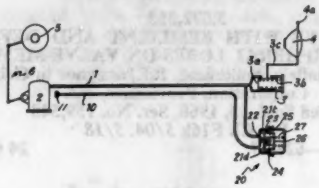
A power valve assembly has a housing with first and second concentrically formed valve seats therein and contains first and second telescoping valve members adapted to respectively cooperate with the first and second seats for controlling flow of fuel therethrough; a first spring tends to move the valves away from each other while a second spring functions to resiliently urge both valves against their respective seats.

3,572,387
MULTISTAGE POWER VALVE ASSEMBLY
David L. De Martelaere, 20142 N. Larkmoor, Southfield, Mich. 48076, and Walter F. Dziedzic, 6368 Beechton, Detroit, Mich. 48210
Filed Dec. 16, 1968, Ser. No. 783,827
Int. Cl. F16k *11/14*
U.S. Cl. 137—630.22 4 Claims



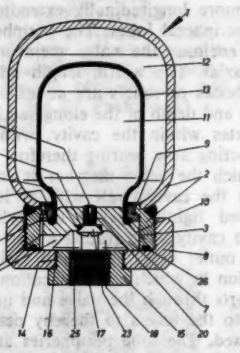
A power valve assembly has a housing with first and second concentrically formed valve seats therein and contains first and second generally telescoped valve members adapted to respectively cooperate with the first and second seats for controlling flow of fuel therethrough; a first spring tends to move the valves away from each other while a second spring functions to resiliently urge both valves against their respective seats.

3,572,388
HYDRAULIC TRANSMISSION UNITS
Albert d'Heurle, Plessis-Robinson, France, assignor to Cible-Angers, Bobigny, France
Filed June 11, 1969, Ser. No. 832,397
Claims priority, application France, June 14, 1968, 154,943
Int. Cl. F16l *55/04*; F15b *15/17*
U.S. Cl. 138—26 5 Claims



A hydraulic transmission unit for orientating the headlamp of a vehicle and including parallel hydraulic transmission and hydraulic detection circuits connected to a compensator device consisting of a pair of chambers, one of which is connected to the transmission circuit while the other is connected to the detection circuit whereby variations in temperature cause equal variations in the volumes of the chambers.

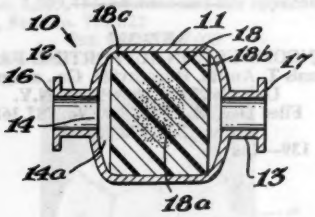
3,572,389
HYDRO-PNEUMATIC PRESSURE RESERVOIR
Walter Wieland, Buderich, Germany, assignor to Langen & Co., Dusseldorf, Germany
Filed Aug. 14, 1969, Ser. No. 850,163
Claims priority, application Germany, Aug. 17, 1968, P 17 51 917.4
Int. Cl. F16l *55/04*
U.S. Cl. 138—30 2 Claims



A hydro-pneumatic pressure reservoir in which the housing thereof is provided with an aperture and a movable pliant wall or partition divides the interior of a housing into an outer liquid chamber and an inner gas chamber. The wall is maintained in a liquid and gas type relationship between a clamping ring and a cover which tightly seals the aperture of the housing. The cover is provided with a gas inlet hole having a closure for filling the gas chamber as well as a liquid connection with the liquid

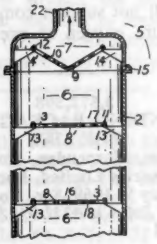
connection being in communication with the liquid chamber via channels in the cover and passages between the clamping ring and the housing.

3,572,390
SELECTIVELY POROUS BODIES AND METHOD FOR THE PREPARATION THEREOF
Wallace T. McMichael, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.
Original application Nov. 21, 1966, Ser. No. 595,934, now Patent No. 3,519,708, dated July 7, 1970. Divided and this application Mar. 26, 1969, Ser. No. 840,565
Int. Cl. F15d 1/02
U.S. Cl. 138—41 6 Claims



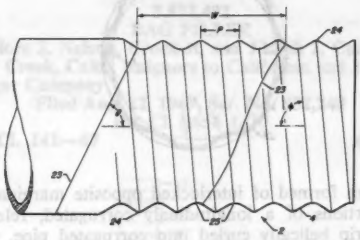
Flexible open celled foam is impregnated with a hardening resin and a portion of the foam collapsed to form a solid portion and the hardening resin cured to produce selectively porous bodies.

3,572,391
FLOW UNIFORMIZING BAFFLING FOR CLOSED PROCESS VESSELS
A. Adler Hirsch, 141 Norwood St., Shreveport, La. 71105
Continuation-in-part of application Ser. No. 600,878, Dec. 12, 1966. This application July 10, 1969, Ser. No. 840,717
Int. Cl. F15d 1/02
U.S. Cl. 138—40 10 Claims



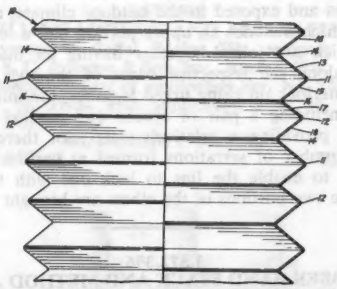
Within closed flow vessels velocity is greatest at the center and decreases toward the walls. This non-uniformity predominates more with laminar flow than with turbulent flow. Near the outlet a directional effect further funnels flow centerward. Both of these short-circuiting actions are corrected by regulating hydraulic resistance transversely as by a series of orified guidance baffles having ratio of open area per unit gross area of continguous surface increasing with radial distance from axis of flow or sets of stacked meshed discs of different diameters. These favor the distal flow lines. Best control at the outlet is by a contoured shape pointing against the direction of flow.

3,572,392
THREADED FILAMENT WOUND PIPE AND THE METHOD OF MANUFACTURE THEREOF
Jack Lowrie McLarty, Milwaukee, Wis., assignor to Universal Oil Products Company, Des Plaines, Ill.
Filed July 9, 1969, Ser. No. 840,403
Int. Cl. F16l 9/16
U.S. Cl. 138—109 11 Claims



An improved threaded filament wound pipe and the method of manufacture thereof. The improvement comprises helically winding resin impregnated fiberglass filaments upon a mandrel knurled at the ends in the form of helical threads. The helical winding pitch is greater than the thread pitch. As a result, the fiberglass filaments alternately deviate in radial disposition with respect to the pipe axis, thereby forming both interior and exterior pipe threads at the ends of the finished pipe.

3,572,393
COLLAPSIBLE CORRUGATED TUBE
Gerald A. Eisert, Hastings, Minn., assignor to Central Research Laboratories, Inc., Red Wing, Minn.
Filed Oct. 27, 1969, Ser. No. 869,516
Int. Cl. F16l 11/00
U.S. Cl. 138—121 8 Claims

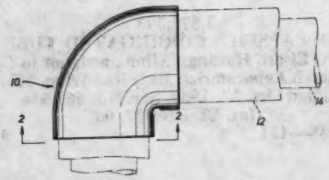


A collapsible and extensible corrugated cylindrical tube characterized by having alternating convolutions staggered so as to permit maximum collapsibility of the tube without materially reducing maximum extensibility of the tube. Alternating outer convolutions of lesser diameter nest between alternating outer convolutions of greater diameter when the tube is in collapsed state. Alternating inner convolutions of greater diameter nest between inner convolutions of lesser diameter when the tube is in collapsed state. The tube structure is particularly useful in collapsible boots for the slave arms of remote-control master-slave manipulators. By means of the collapsible structure, reduction in range of operation of the arm due to the boot can be materially lessened.

3,572,394
LOCK SEAM FOR HELICAL CORRUGATED PIPE
Paul K. Davis, Alameda, Calif., assignor to Pacific Roller Die Co., Inc., Hayward, Calif.
Filed Nov. 19, 1968, Ser. No. 777,066
Int. Cl. F16l *9/06, 9/16*
U.S. Cl. 138—154 4 Claims

A seam formed of interlocked opposite marginal side edge portions of a longitudinaly corrugated, relatively thick, strip helically curled into corrugated pipe, which seam is within the outside and inside diameters of the pipe and the bounds of a standard corrugated coupling.

3,572,395
PROTECTIVE ELBOW
Noah J. Burns, Jr., Beaumont, Tex., assignor to Trend Products, Inc.
Filed Dec. 23, 1968, Ser. No. 786,289
Int. Cl. F16l *11/00*
U.S. Cl. 138—162 7 Claims

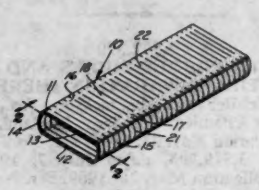


For use in protecting pipes which are covered with insulation and exposed to the outdoor climate, an elbow fitting which includes an upper portion and a lower portion which are joined together having an interlocking means along the respective edges of the two portions which interlock on being urged together, the interlocking means including a pair of spaced and parallel protruding lips providing a relatively deep slot therebetween, and a number of serrations formed at various areas in the slot to enable the lips to lock one with the other when the two portions of the elbow are brought together.

3,572,396
RUBBER BAND STACK AND METHOD AND APPARATUS FOR ITS MANUFACTURE
Henry R. Hoffman and Harry L. Sidenstick, Cincinnati, Ohio, assignors to Kett Tool Co., Cincinnati, Ohio
Filed Sept. 17, 1968, Ser. No. 760,200
Int. Cl. F16l *9/12, 9/22*
U.S. Cl. 138—178 4 Claims

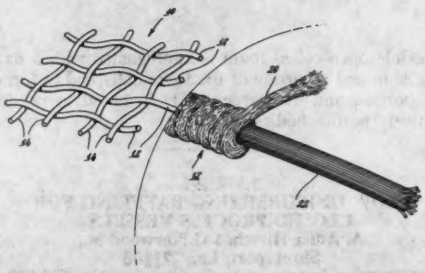
A rubber band assembly for use in a machine for automatically wrapping a band around an article, the rubber band assembly comprising an elongated rubber tube which is slit transversely to define individual bands. The individual bands are temporarily attached to one another by two uncut hinge portions which controls pivotal movement of the endmost band as it is pivoted 90° in the automatic wrapping machine.

Also disclosed are an apparatus and method for forming the band assembly from an uncut tube. During the cutting operation, the tube is flattened and compressed by a platen which also carries a depending knife. The knife cooperates with a planar anvil provided with two spaced, longitudinal slots. A portion of the rubber tube is forced



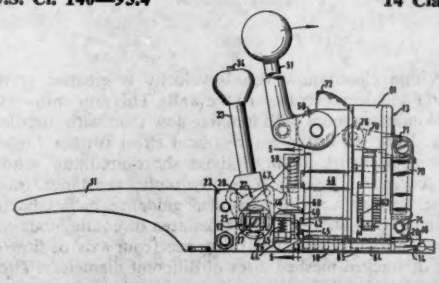
into each of the slots by the platen and remains uncut by the knife to form the two spaced interconnecting hinge portions between individual bands.

3,572,397
NONCOMBUSTION-SUPPORTING FABRIC
Dennis T. Austin, Hogansville, Ga., assignor to Uniroyal, Inc., New York, N.Y.
Filed Dec. 27, 1968, Ser. No. 787,368
Int. Cl. D03d *15/00*
U.S. Cl. 139—426 9 Claims



A fabric which will not support combustion is woven of warp and filling threads which consist of a mixed nylon and asbestos fiber yarn wrapped about glass filaments. The asbestos fiber content of the yarn is at least 85% by weight, and the balance is a nylon fiber of a special high temperature resistant variety such as Nomex. The resulting fabric will not support combustion, even in an environment of pure oxygen at pressures greater than atmospheric.

3,572,398
TOOLS FOR BANDING PACKAGES, PARCELS OR THE LIKE
Robert D. Sansum, Harpenden, England, assignor to Gerrard Industries Limited, London, England
Filed May 9, 1969, Ser. No. 823,294
Int. Cl. B21f *9/02*
U.S. Cl. 140—93.4 14 Claims



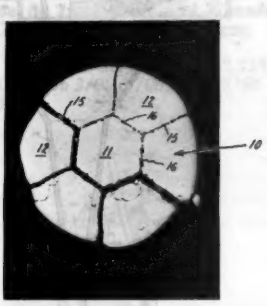
A tool for securing together by means of a seal the ends of a flexible band put around a package makes use

of the movement of the sealing head away from the base of the tool necessary to disengage the sealing head from the closed seal to release tension in the part of the band between the seal and the band supply and then to sever the band. To avoid fibrillation, tension is released before severing by arranging the cutter to be moved by a part of a pawl after the pawl has been disengaged from a ratchet maintaining tension.

3,572,399
STRANDED TUNGSTEN WIRE INCANDESCENT LAMP FILAMENT

John L. Walter, Scotia, N.Y., and Kenneth S. G. Pertwee, South Euclid, Ohio, assignors to General Electric Company

Original application Aug. 5, 1966, Ser. No. 570,602, now Patent No. 3,509,411. Divided and this application Nov. 29, 1968, Ser. No. 779,822
Int. Cl. B21f 7/00
U.S. Cl. 140—71.5 **3 Claims**

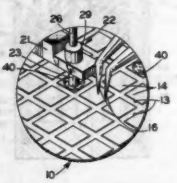


A tungsten wire incandescent lamp filament is disclosed which has a much greater resistance to failure than conventional filaments, particularly under repetitive shock loads. The improved filament is manufactured by spirally twisting a plurality of round tungsten wires around a round central tugnsten wire and drawing through a die to reduce the effective transverse dimension of the composite to form a composite body having a circular cross-section with the central strand having a polygonal cross-section having a plurality of planar surfaces corresponding in number to the outer strands, the outer strands having corresponding planar surfaces in areal engagement with the planar surfaces of the central strand and planar surfaces in areal engagement with adjoining outer strands.

3,572,400
DISPENSING OF FLUIDS TO SMALL AREAS

Bernard G. Casner, Emmaus, and Ray T. Goulstone and Peter R. Hance, Allentown, Pa., assignors to Western Electric Company, Incorporated, New York, N.Y.

Filed Aug. 31, 1967, Ser. No. 664,703
Int. Cl. B67c 3/28
U.S. Cl. 141—1 **29 Claims**



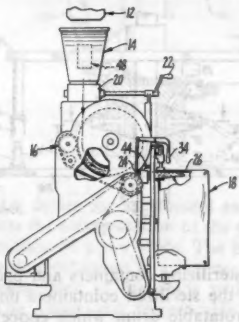
In the manufacture of a number of small parts, selected areas of the surface of a sheet are inspected and defective areas are magnetically identified with a specially formulated, relatively high viscosity magnetic fluid. The sheet is then divided into a number of small parts and those parts formed from defective areas of the sheet are magnetically separated from the remaining parts.

In this method, air pressure is applied to a free piston located within the barrel of a pen that forces the magnetic fluid through the capillary tip of the pen onto the selected surface areas. Methods and apparatus are provided for controlling the size and shape of the magnetic mark.

3,572,401
BAG FILLER

Theodore J. Nelson, Crockett, and Joseph J. Cuzic, Walnut Creek, Calif., assignors to California and Hawaiian Sugar Company

Filed Aug. 22, 1969, Ser. No. 852,248
Int. Cl. B65b 3/10
U.S. Cl. 141—67 **4 Claims**

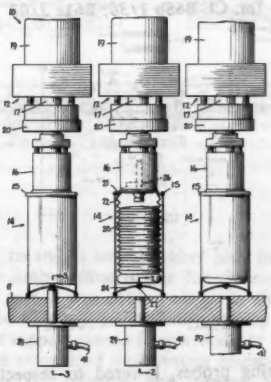


A device for packing bags tightly with sugar or similar materials wherein an airblast is provided to at least partially open the bag and the pre-weighed load of material being put in the bag is divided into increments, one of which is added rapidly while the bag is being shaken and the second of which is added at a slower rate. Normally the first increment is about 90 to 95% of the total material while the second increment is 5 to 10% of the total.

3,572,402
FILLING METHOD AND APPARATUS

Raymond W. Beffel, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

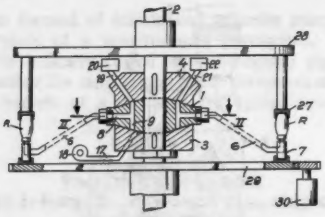
Continuation-in-part of application Ser. No. 743,745, July 10, 1968. This application June 26, 1969, Ser. No. 839,137
Int. Cl. B65b 1/04, 3/04
U.S. Cl. 141—3 **11 Claims**



Method of and apparatus for charging aerosol containers having a propellant charging valve in the base by

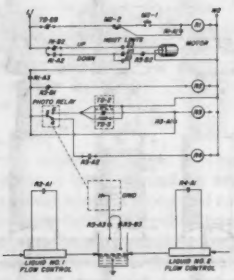
securing the container in its upright position to a spinner table adapted to support the container, rotating said container while introducing a predetermined quantity of product down through the top of the container, and by introducing a predetermined quantity of propellant up through a filling platform and in through the base of the container.

3,572,403
PACKAGING MACHINE FOR PRODUCTS UNDER PRESSURE
Robert Angue, Antibes, France, assignor to A.T.A.D.-Approvisionnement - Transport - Aerien - Distribution, Paris, France
Filed Apr. 23, 1968, Ser. No. 723,546
Claims priority, application France, Apr. 24, 1967, 103,950
Int. Cl. B65b *31/00*
U.S. Cl. 141—62 **2 Claims**



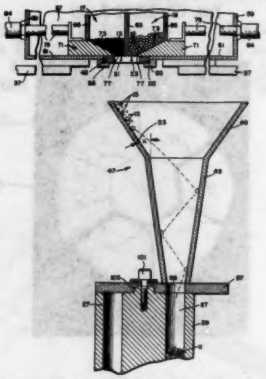
A device for sterilizing containers and packaging sterized products in the sterilized cointainers under pressure that includes a rotatable drum which cooperates with a fixed distributor body. Conduits through the distributor body connect the sterilizing means and product sources, including such devices as pressurized tanks and a vacuum pump, with registering ducts in the drum. These ducts which rotate with the drum register in succession with each of the supply conduits of the distributor body during a revolution of the drum. Conduits connected on one end with the ducts within the drums are connected on their other ends through valve means with the containers to be sterilized and filled. The containers are mounted on a device which rotates with the drum.

3,572,404
APPARATUS FOR METERING LIQUIDS TO TANK COMPRISING LEVEL SENSING CONTROLS
William Woodrow Allison and James A. Farmer, Fort Worth, Tex., assignors to American Cyanamid Company, Stamford, Conn.
Filed Apr. 8, 1969, Ser. No. 814,337
Int. Cl. B65b *1/30*; B61c *3/02*
U.S. Cl. 141—95 **3 Claims**



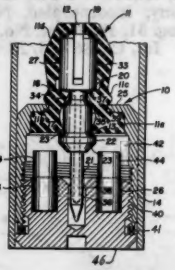
Level sensing probes, lowered to respective different levels in a tank, control flow of liquid to the tank in measured volumes determined by liquid level in the tank. First liquid fills tank to lower probe level whereupon automatically first liquid feed is stopped and second liquid feed is started and continued until liquid reaches upper probe level whereupon automatically all feed is stopped and probes are raised away from liquids. Relay circuits for automatic control and hoisting apparatus are detailed.

3,572,405
APPARATUS FOR BLENDING PARTICLES
Philip T. Mattson, Jr., La Jolla, and Dennis W. Stevens, San Diego, Calif., assignors to the United States of America as represented by the United States Atomic Energy Commission
Filed June 6, 1968, Ser. No. 735,119
Int. Cl. B65b *1/02, 3/02*
U.S. Cl. 141—105 **10 Claims**



Particles of at least two groups are fed at predetermined rates of flow to impinge on a deflecting surface means which causes the particles to blend uniformly as they fall into a cavity in which the blended particles are shaped into an article. The particles of the respective groups are blended uniformly even though the particles may be unequal in size and density and the ratio of the respective particles in the article is varied considerably from a one to one ratio.

3,572,406
LIGHTER CHARGING VALVES
John R. Snyder, Euclid, Ohio, assignor to Eaton Yale & Towne Inc., Cleveland, Ohio
Filed Aug. 5, 1968, Ser. No. 750,146
Int. Cl. F16k *15/20*
U.S. Cl. 141—349 **4 Claims**



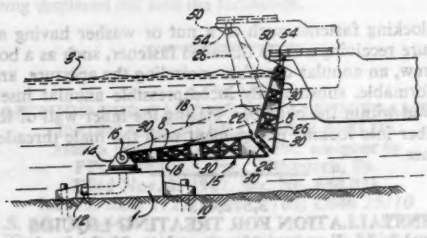
A lighter charging valve for regulating the introduction of pressurized gaseous fuel into a gas-type cigarette lighter. A resilient valve body is attached to a bushing, the latter of which being attached to the cigarette lighter case. The

resilient valve body has a fluid flow passage extending therethrough. A valve insert assembly is disposed within the resilient valve housing and includes a first and a second valve head for sealing against corresponding first and second valve seats within the resilient valve body. Pressurized gaseous fuel is introduced into the lighter by axially moving the valve insert and the pressurized gaseous fuel through a central bore in the valve insert to an exit between the first and second valve seats. The first valve is unseated from said first valve seat by the axial movement thereby permitting the introduction of the gaseous fuel into the lighter housing; the second valve and valve seat are in sealing engagement precluding the escape of the gaseous fuel to the exterior of the lighter. A storage area within the charging valve is also provided for the retention of replacement flints.

3,572,407
FLUID DISPENSING SHUT OFF VALVE ASSEMBLY
Clifford Delorme, St. James, Manitoba, Canada, assignor to Arnett Company Limited, Winnipeg, Manitoba, Canada
Filed Dec. 30, 1968, Ser. No. 787,739
Int. Cl. B65b *3/00, 3/06;* **B67c** *3/00*
U.S. Cl. 141—362 **10 Claims**

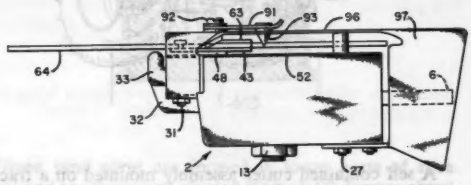
A channel runs through the dispensing head and carries the rubber dispensing tube and a guide supports a plate shut off valve which is actuated by a weight cooperating with a release plate. The plate shut off engages the rubber tube and squeezes it shut into a semi-cylindrical recess.

3,572,408
COMBINED SHIP MOORING AND LOADING-UNLOADING DEVICE
Walter R. Hnot, Mountainside, N.J., assignor to Esso Research and Engineering Company
Filed Apr. 29, 1968, Ser. No. 725,081
Int. Cl. B63b *21/00*
U.S. Cl. 141—387 **9 Claims**



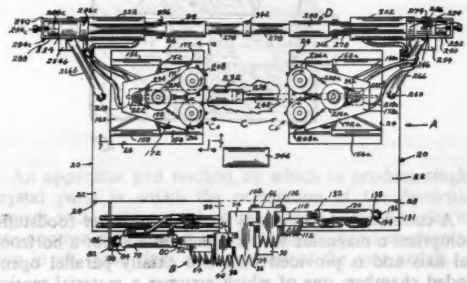
An improved offshore ship mooring and ship loading-unloading structure comprising an arm having a first portion mounted for universal rotation at one extremity and having hingedly secured at its other extremity for limited pivotal movement, a second portion. A cargo carrying conduit located within said first and second portions and having at its free end means for securement to a ship whereby the mooring and cargo transfer structure are contained within a unitary structure.

3,572,409
SABER SAW
Simon J. Hoffman, 13115 E. Jefferson St., Detroit, Mich. 48215
Filed Dec. 13, 1967, Ser. No. 690,265
Int. Cl. B27b *19/08*
U.S. Cl. 143—68 **7 Claims**



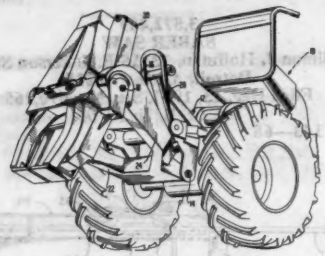
A saber saw device for attachment to a standard drill motor converts the rotary motion of the drill motor to reciprocating motion of a saw blade. The blade is locked to the reciprocable mechanism in a manner to prevent inadvertent disengagement of the blade while the saw is in operation. The blade and reciprocable mechanism are compatibly designed so that either a single ended or double ended blade may be mounted on the driving mechanism.

3,572,410
DEVICE FOR DELIMBING AND CUTTING A FELLED TREE
Charles E. McElderry, % Mack Welding Company, Inc., 9206 Grand Ave. Place, Duluth, Minn. 55808
Filed Dec. 4, 1968, Ser. No. 781,148
Int. Cl. A01g *23/02*
U.S. Cl. 144—3 **7 Claims**



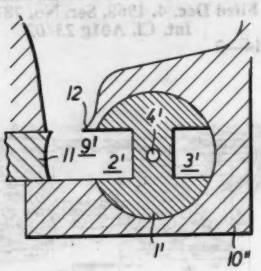
A support means, a tree delimber unit having articulated arcuate limb cutting blades for placement about a felled tree, a pair of tree cutting blades in alignment with the articulated blades together with gripping rollers positioned on the support means intermediate of and in alignment with the articulated limb cutting blades and the tree cutting blades for gripping and moving a felled tree through said limb cutting blades and to the tree cutting blades.

3,572,411
TREE HARVESTER
Samuel J. Coughran, Jr., Cedartown, Ga., assignor to Rome Industries, Incorporated, Cedartown, Ga.
Filed Dec. 10, 1968, Ser. No. 782,626
Int. Cl. A01g *23/02*
U.S. Cl. 144—3 11 Claims



A self contained cutter assembly mounted on a tractor vehicle includes a pair of pivoted arms which act not only as a back up for the guillotine shear blade but also as gripping or jaw elements for grasping a tree after it is felled. The cutter assembly is mounted for rotation to allow it to act either as a cutting device or as a grappling device in various positions. The felling, cutting to lengths and topping operations as well as handling, bunching and skidding may all be performed by the device, requiring but a single operator to perform these functions.

3,572,412
APPARATUS FOR COMMINUTING FOODSTUFFS
Toni Reifenhauser, Burglahr, Westerwald, Germany
Filed Aug. 19, 1968, Ser. No. 753,509
Int. Cl. B26d *4/34*
U.S. Cl. 146—78 7 Claims

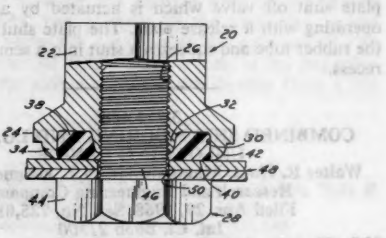


A comminuting apparatus for meat or other foodstuffs comprises a magazine which is indexible about a horizontal axis and is provided with two axially parallel open-ended chambers one of which assumes a material-receiving position when the other assumes a material-discharging position and vice versa. A plunger expels material from that chamber which dwells in discharging position whereby such material moves into the range of knives provided at one axial end of the magazine and serving to comminute the material to form cubes or blocks. At the same time, the other chamber receives fresh material by way of a feed which may include a funnel provided on or in the housing for the magazine or a pivotable carriage which can dump the contents of dollies or like conveyors through an elongated axially parallel inlet of the chamber in receiving position.

3,572,413
CONTAINER AND SNAP-ON COVER
Jay G. Livingstone, 715 W. Market St., Akron, Ohio 44303
Continuation of application Ser. No. 768,214, Oct. 11, 1968, which is a continuation of application Ser. No. 665,482, Sept. 5, 1967, which in turn is a continuation-in-part of application Ser. No. 545,676, Apr. 27, 1966. This application June 19, 1969, Ser. No. 866,404
Int. Cl. B65d *23/00, 41/16*
U.S. Cl. 150—.5 13 Claims

A plastic container with an opening at the top and bulging inwardly adjacent its top, as in a neck or spout or the like is provided with a snap-on skirted cover, usually an ordinary cap but it may be a shaker top, etc. Different depending annular tongue means on the fitment are disclosed for pressing outwardly at the bulge of the fitment to enlarge and/or lengthen the spout and press it into sealing contact against either the skirt or top of the cover, or both. The container need not extend to the inside of the top of the cover.

3,572,414
LOCKING FASTENER
George R. Onufer, Bloomfield Hills, Mich., assignor to Russell, Burdsall & Ward Bolt and Nut Co., Port Chester, N.Y.
Filed Apr. 7, 1969, Ser. No. 813,971
Int. Cl. F16b *39/284*
U.S. Cl. 151—19 3 Claims

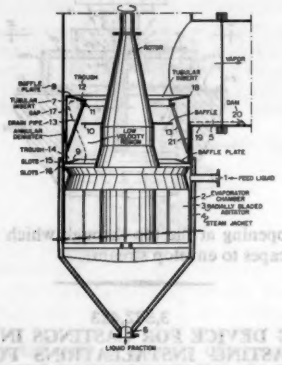


A locking fastener such as a nut or washer having an aperture receiving a male threaded fastener, such as a bolt or screw, an annular chamber encircling the aperture, and a deformable, substantially incompressible annular insert received within the chamber, biasing the inner wall of the chamber into locking engagement with the male threaded fastener.

3,572,415
INSTALLATION FOR TREATING LIQUIDS
Gerard L. M. Voncken, Munstergeleen, Netherlands, assignor to Stamicarbon N.V., Heerlen, Netherlands
Filed Jan. 13, 1969, Ser. No. 790,636
Claims priority, application Netherlands, Jan. 11, 1968, 6800384, 6800385
Int. Cl. B01d *1/22*
U.S. Cl. 159—6 6 Claims

A film evaporator is disclosed in which at least the topmost of the baffles for separating entrained liquid par-

ticles from the vapor discharge is provided with a guide surface leading to a trough. Drain pipes leading obliquely downwardly from the trough convey the collected liquid to an area of sufficiently low gas velocity as to allow the



liquid to flow to the condensate discharge port. Some of the baffles are located on a concentric insert having an upper end located above the base of the vapor discharge line. As a further measure, a dam is then provided in the base of the vapor discharge line.

3,572,416

STIMULATION OF PRODUCING WELLS

Wilson L. Kinney, Findlay, Ohio, and Walter B. Kirk, Jr., Robinson, Ill., assignors to Marathon Oil Company, Findlay, Ohio

No Drawing. Filed Nov. 6, 1969, Ser. No. 874,670
Int. Cl. E21b *43/27*
U.S. Cl. 166—307 **24 Claims**

Hydrocarbon production from a producing well in fluid communication with a hydrocarbon-bearing subterranean formation is improved by injecting sequentially into the formation 1–500 gallons of acid per vertical foot of hydrocarbon-bearing formation, 0.1–10 volumes of water per volume of acid and 1–500 gallons of micellar dispersion per vertical foot of hydrocarbon-bearing formation and then displacing the acid and micellar dispersion out into the formation with a drive fluid, preferably a hydrocarbon drive fluid in an oil-wet formation. Thereafter, the producing well is permitted to reproduce. The acid and micellar dispersion can remain in contact with hydrocarbon-bearing formation up to about six hours before being displaced out into the formation.

3,572,417

METHOD FOR CASTING METALS IN FOAMED INORGANIC REFRACTORY MOLDS

Marco Wismer, Gibsonia, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 2, 1967, Ser. No. 680,031
Int. Cl. B22c *1/22*; B29d *27/04*; C04b *35/10*
U.S. Cl. 164—43 **29 Claims**

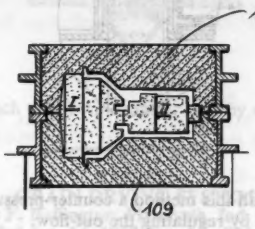
This invention relates to casting or molding metals wherein the mold comprises a refractory inorganic oxide foam which has been formed by heating a filled organic foam at a temperature and for a time sufficient to substantially decompose the organic binder to a carbonaceous state, or, alternatively, to substantially completely consume the organic binder to form a refractory inorganic foam.

3,572,418

METHOD FOR ASSEMBLING MOLDING FLASKS WITH SAND CORES

Hans-Dieter Keller, Todenhausen, and Horst Henkel, Friedensdorf, Biedenkopf, Germany, assignors to Fritz Winter Eisengiesserei oHG, Allendorf, Germany

Filed May 3, 1968, Ser. No. 726,490
Claims priority, application Germany, May 5, 1967, W 43,924
Int. Cl. B22c *9/10, 17/08*
U.S. Cl. 164—28 **9 Claims**



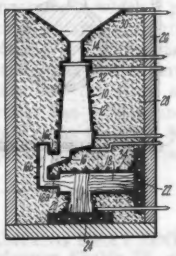
Green sand cores are formed in lower parts of core boxes and are thereupon pivoted through 90 degrees about horizontal axes to setting positions. The upper halves of the lower core box parts are thereupon removed and the drag of a molding flask is placed over the cores. The cores are inverted with the drag so that their prints rest in the drag and a cope is placed on top of the drag.

3,572,419

DOUBLY-ORIENTED SINGLE CRYSTAL CASTINGS

Robert B. Barrow, Cheshire, Conn., Barry J. Piearcey, Brixham, Devon, England, and Larry W. Sink, Milwaukie, Oreg., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Mar. 13, 1969, Ser. No. 806,874
Int. Cl. B22d *25/06*
U.S. Cl. 164—60 **10 Claims**



An apparatus and method by which to produce single crystal parts in which the orientation of the dendritic growth within the crystal in two planes at right angles to one another is described. In effect this produces an orientation in all three right angle planes of the cast article.

3,572,420

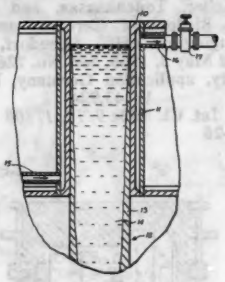
METHOD FOR MOULD COOLING IN CONTINUOUS CASTING

William H. Summers, Hampton Hall, near Malpas, England, assignor to Concast AG, Zurich, Switzerland

Filed Feb. 21, 1968, Ser. No. 707,060
Claims priority, application Switzerland, Feb. 24, 1967, 2,846/67
Int. Cl. B22d *11/00*
U.S. Cl. 164—82 **3 Claims**

This is a method of controlling the cooling of a continuous-casting mould in which a coolant such as water is

circulated through the hollow interior of the mould wall from an inlet at the bottom to an outlet at the top. In



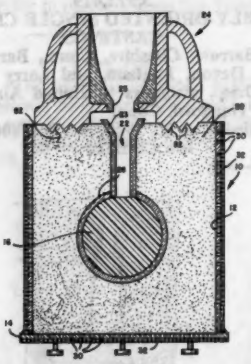
accordance with this method a counter-pressure is applied to the coolant by regulating the out-flow.

3,572,421

AIR BREATHING FLASK FOR FOUNDRY MOLDS

Charles C. Mezey, Lake Orion, and Angelo Paoli, Troy, Mich., assignors to Full Mold Process, Inc., Lathrup Village, Mich.

Filed Dec. 11, 1967, Ser. No. 689,363
Int. Cl. B22c 7/00
U.S. Cl. 164—237 6 Claims



Disclosed herein is a flask and pouring apparatus for casting molten metals using vaporizable patterns wherein the flask has air breathing walls that are provided with a permeable layer, slotted vents, or screen vents.

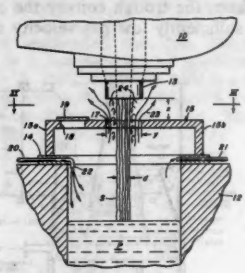
3,572,422

APPARATUS FOR SHROUDING A POURING STREAM AND MOLTEN CASTING SURFACE WITH A PROTECTIVE GAS

Richard E. Lyman, Homewood, Ill., assignor to United States Steel Corporation

Filed Dec. 10, 1968, Ser. No. 782,578
Int. Cl. B22d 11/00
U.S. Cl. 164—273 3 Claims

A method and apparatus for shrouding a stream of molten metal and the casting meniscus with a protective gas as the metal is poured from a nozzle into a mold. Apparatus includes an enclosure at the top of the mold and means for injecting gas into the enclosure at a location remote from where the stream enters. Enclosure has a



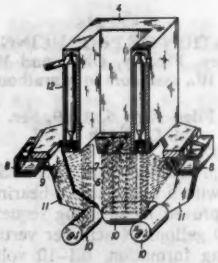
restricted opening at the top through which stream enters and gas escapes to envelop stream.

3,572,423

COOLING DEVICE FOR CASTINGS IN CONTINUOUS CASTING INSTALLATIONS FOR HEAVY METALS OR ALLOYS THEREOF, PARTICULARLY STEEL

Klaus Bick, Paderborn, Wolfgang Weinreich, Schloss Neuhaus, and Lothar Harmsen, Paderborn, Germany, assignors to Paderwerk Gebr. Benteler, Schloss Neuhaus, Kreis Paderborn, Germany

Filed Sept. 25, 1968, Ser. No. 762,481
Claims priority, application Austria, Oct. 2, 1967, 8,926/67
Int. Cl. B22d 11/12
U.S. Cl. 164—283 11 Claims



A cooling device for castings in continuous casting installations for heavy metals or alloys thereof, particularly steel, which comprises a copper casting die serving as continuous mold to the interior of which a coolant is admitted for indirectly cooling a casting. A cooling section is formed by spraying nozzles following the casting die and serving for directly spraying the coolant onto the casting. This cooling section substantially consists of at least one water chamber equidistantly surrounding the casting and connected to at least one row of flat jet nozzles which are formed and arranged in such a manner that they spray flat jets of high kinetic energy onto the surface of the casting. These jets are intended continuously to extend axially along the entire length of said cooling section and substantially spaceless join up with each other in the area of impingement on the surface of the casting.

3,572,424

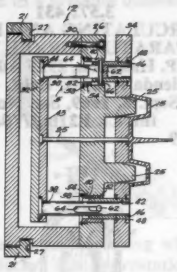
DOUBLE ACTING EJECTING MECHANISM

John R. Byrne, 1519 Prospect St., Watertown, Wis. 53094

Filed Sept. 5, 1968, Ser. No. 757,568
Int. Cl. B22d 17/22
U.S. Cl. 164—347 10 Claims

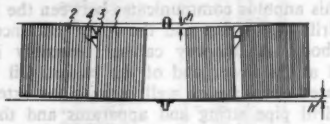
Disclosed herein is a mold or die having double acting thrust transmitting stripping and knock-out devices

each of which includes a thrust pin having a slot with a laterally offset notch, a first sleeve mounted on said thrust pin and having an angularly disposed slot, a second sleeve concentrically mounted on said first sleeve



and having a slot with a laterally offset notch, and a lock pin arranged in the slots to lock the first sleeve either to the thrust pin or to the second sleeve depending on the position of the lock pin in the notches of the slot.

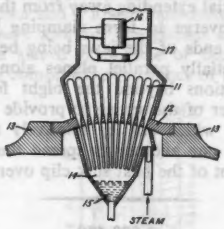
3,572,425
ROTARY REGENERATIVE HEAT EXCHANGERS
Herbert Brandt, Rothemuhle, and Gerhard Kritzler, Freudenberg, Germany, assignors to Apparatebau Rothemuhle, Brandt & Kritzler, Westphalia, Germany
Filed Oct. 9, 1969, Ser. No. 865,053
Claims priority, application Germany, Feb. 13, 1969, P 19 07 073.6; Feb. 24, 1969, P 19 09 101.1; Great Britain, May 9, 1969, 23,850/69
Int. Cl. F28d *19/04*
U.S. Cl. 165—9 **12 Claims**



A rotary regenerative air preheater has, when cold, non-planar axial end faces of the regenerator mass, preformed so that upon thermal deformation in use they attain a substantially planar condition. The preheater has independently movable annular portions, for use in situations where a large regenerator is needed. Specific interengaging members between the two concentric portions are shown, including one wherein a projection on one portion enters into a recess in the side wall of the other portion.

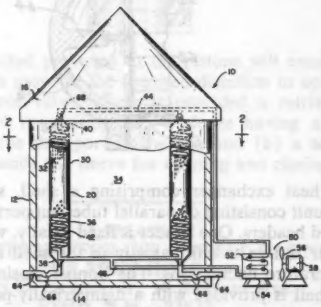
3,572,426
UNDERWATER HEAT EXCHANGE SYSTEM
Russell N. Edwards, Cincinnati, Ohio, assignor to General Electric Company
Filed Oct. 5, 1967, Ser. No. 673,051
Int. Cl. F28d *5/00*
U.S. Cl. 165—47 **5 Claims**

A safe, efficient and simple system for transferring heat from within an underwater vehicle to the surrounding water environment comprises an array of sealed tubes passing through the outer skin of the vehicle and protruding into the water surrounding the vehicle. Each of the tubes is designed to withstand the pressure of the underwater environment. Each tube contains a heat exchange medium having a high heat of vaporization operating at



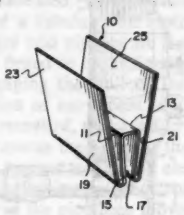
a pressure such that it will transfer heat by vaporizing and condensing.

3,572,427
GRAIN DRYING SYSTEM
James F. Buffington, Plymouth, Ind. 46563
Filed Jan. 14, 1969, Ser. No. 791,058
Int. Cl. F21b *29/00*
U.S. Cl. 165—61 **11 Claims**



A grain drying apparatus in which a plurality of stacks are disposed in a grain storage compartment. The stacks contain coils for cooling or heating fluid, and the side walls of the stacks are perforated to permit a flow of air from the stored grain into the space around the coils. The conduits connecting the cooling and heating means to the stack selectively make the coils thereof heating or cooling coils, and some of the stacks cool while other of the stacks heat.

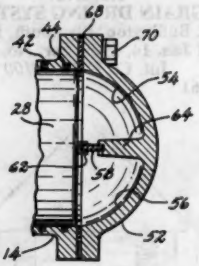
3,572,428
CLAMPING HEAT SINK
Anthony T. Monaco, Skokie, Ill., assignor to Motorola, Inc., Franklin Park, Ill.
Filed Jan. 29, 1969, Ser. No. 795,018
Int. Cl. H01l *1/12*
U.S. Cl. 165—80 **3 Claims**



A clip-on heat sink for use with thermo-pad type transistors is made in the form of a unitary piece of heat-conductive, black-anodized spring aluminum folded on

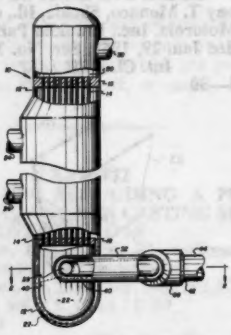
itself approximately at its center to provide an opening which fits over the transistor and tightly engages the transistor in heat conductive relationship. The portions of the spring material extending away from the bight formed by the fold converge to form clamping jaws, with the material at the ends of the jaws being bent back to extend in substantially parallel planes along each of the converging portions beyond the bight formed by the fold at the center of the spring to provide a pair of gripping extensions which can be relatively moved toward and away from one another to spread the jaws apart to enable placement of the heat sink clip over the transistor.

3,572,429
HEAT EXCHANGER
Royse Myers, 4118 Hounds Trail, Racine, Wis. 53402
Filed Jan. 13, 1969, Ser. No. 790,669
Int. Cl. F28f *9/00*
U.S. Cl. 165—82 **1 Claim**



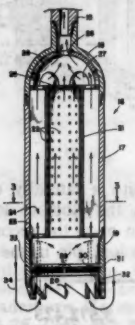
A heat exchanger comprising a shell, surrounding a core-unit consisting of parallel tubes supported by axially-spaced headers. One header is fixed axially, while the other header is free to shift axially in the shell in response to temperature fluctuations. The bonnet closing one end of the shell is provided with a diametrically-positioned resilient sealing member which engages the surface of the axially-free header to provide a pair of chambers in the bonnet, and to prevent fluid from passing from one chamber to the other. Means is also provided to indicate instances of leakage between the mutual peripheries of the shell and the axially-free header.

3,572,430
FLOATING HEAD HEAT EXCHANGER
Howard O. Charnock, Jr., Chatsworth, Calif., assignor to North American Rockwell Corporation
Filed Apr. 1, 1969, Ser. No. 812,212
Int. Cl. F28f *3/00*
U.S. Cl. 165—82 **11 Claims**



A shell-and-tube heat exchanger which experiences differential expansion between the shell and tubes where the exchanger has a floating head that cooperates with a double-pipe mechanical joint which compensates for any differential motion between the floating head and the stationary shell.

3,572,431
FLUID CIRCULATING AND RETRIEVING APPARATUS FOR OIL WELLS
Donald P. Hammon, 2939 Adelita Drive, Hacienda Heights, Calif. 91745
Filed Sept. 8, 1969, Ser. No. 856,107
Int. Cl. E21b *31/08*
U.S. Cl. 166—99 **3 Claims**



A retrieving apparatus for picking up debris from the bottom of oil wells comprises a hollow cylindrical body communicating at its upper end with the lower end of a drill pipe string and terminating at its lower end in an entrance opening. In the preferred embodiment there is supported in the body a cylindrical basket of smaller dimensions than the body to define an annulus between the exterior of the basket and the internal walls of the body itself. This annulus communicates between the lower end of the drill pipe string and the lower entrance opening of the body. A one-way catcher assembly is loosely mounted at the lower end of the basket. Oil well fluid is circulated down the oil well between the exterior walls of the drill pipe string and apparatus and the interior walls of the well and thence up through the entrance opening, catcher assembly, basket and annulus to the interior of the drill pipe string. This reverse circulation forces debris and the like up through the catcher assembly and into the basket where it is held by the catcher assembly. When the basket is filled, circulation can be maintained through the annulus to thereby wash out remaining small debris and sand at the bottom of the wall. In other embodiments, the basket can be eliminated.

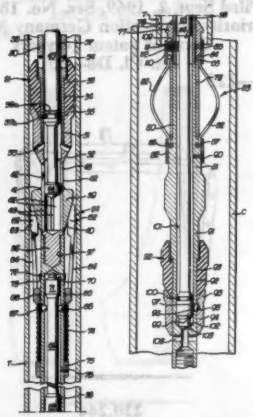
3,572,432
APPARATUS FOR FLOTATION COMPLETION FOR HIGHLY DEVIATED WELLS
Burton W. Aulick, Midland, Tex., assignor to Halliburton Company, Duncan, Okla.
Original application Oct. 17, 1967, Ser. No. 675,808. Divided and this application Sept. 25, 1969, Ser. No. 870,699
Int. Cl. E21b *17/10, 33/14*
U.S. Cl. 166—114 **5 Claims**

Well completion apparatus for highly deviated wells. Cement slurry is placed in the bore hole before the casing string is run. The cement is a delayed setting type cement. The casing contains fluid having a substantially lower density than that of the slurry. The fluid in the casing provides a buoyancy effect on the casing for floating the casing through the deviated zone. In a modified form of the invention, a buoyancy chamber is provided adjacent the lower end of the string in which the buoyancy

fluid is contained. Centralizers are provided on the exterior of the casing and are spaced longitudinally from each other. The centralizers along the buoyancy chamber are spaced apart at greater intervals than the centralizers above the buoyancy chamber. An improved casing-cement bond is achieved due to a pressure differential between the

exterior and the interior of the casing when the casing is run in the cement slurry. The hydrostatic pressure of the slurry urges the casing radially inward, but after the cement hardens, the pressure in the casing increases, thereby urging the casing outwardly against the hardened cement.

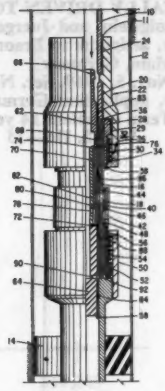
3,572,433
THROUGH TUBING CEMENTING PLUG APPARATUS
Martin B. Conrad, Carpinteria, Calif., assignor to Baker Oil Tools, Inc., City of Commerce, Calif.
Filed May 8, 1969, Ser. No. 823,030
Int. Cl. E21b *33/129, 33/16*
U.S. Cl. 166—132 **16 Claims**



The method of cementing a porous subsurface earth formation in which well casing is set and perforated, wherein a body of cement slurry is displaced through the tubing, and a bridge plug is employed to close off the lower end of the tubing, following displacement of the cement slurry through the perforations. A bridge plug for use in performing such a method, such bridge plug having anchor slips releasably expandable into engagement with the tubing when an expansible spring device at the lower end of the plug emerges from the lower end of the tubing.

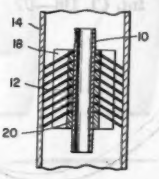
3,572,434
PRESSURE OPENED CIRCULATING SLEEVE
John H. Ecuer, Lafayette, Ind., assignor to Pan American Petroleum Corporation, Tulsa, Okla.
Filed Oct. 3, 1969, Ser. No. 863,474
Int. Cl. E21b *33/124*
U.S. Cl. 166—147 **8 Claims**

A valve for use in a string of tubing suspended in a well bore. A tabular sub having a first port in the wall thereof is connected into the tubing string. A first sleeve valve surrounds the tubular member and in its upper position opens the port and in its lower position closes the port. An upper fluid-driven piston is used to drive the sleeve valve down and a lower fluid-driven piston is used to drive the sleeve upward. The pistons are spring biased away from the sleeve valve, one of the springs having about twice the compressive resistance of the other. Appli-



cation of selected pressures to the pistons will cause the right piston to move in the required direction to open or close the sleeve valve. There is provided a retrievable insertable tool comprising (a) a sleeve having a port aligned with the first port in the sub and (b) a second sleeve valve inside the sleeve for opening and closing this port.

3,572,435
LOAD SUPPORT FOR USE IN WELL CASING OR BORE HOLE
Robert E. Prescott, Jr., 10 Railroad Ave., Exeter, N.H. 03833
Filed Feb. 10, 1969, Ser. No. 797,797
Int. Cl. E21b *23/00*
U.S. Cl. 166—214 **4 Claims**



To support in a tubular well casing or bore hole a pipe consisting of a series of lengths joined by threaded nipples, and a load attached to the lower end of the pipe, stiffly resilient elements are mounted on one or more of the nipples projecting radially outward from the nipple or nipples, when unstressed, to a distance greater than the interior radius of a tubular well casing or bore hole so that when the pipe and nipples are inserted in the casing the elements are flexed to an inclined position, the tips of the elements engaging the wall of the casing to resist a change of direction of movement of the pipe. When the elements slope downward, they tend to support the weight of the pipe. To reverse the slope of the elements the pipe is rotated a few degrees to flex the elements horizontally permitting them to spring into horizontal planes. Up or down movement of the pipe then moves the elements into inclined positions.

ERRATUM

For Class 166—307 see:
Patent No. 3,572,416

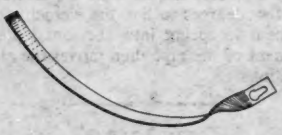
DESIGNS

MARCH 23, 1971

220,239
ELECTRICALLY DRIVEN TOOTHBRUSH
Dieter Rams, Konigstein, and Juergen Greubel, Eschenheim, Germany, assignors to Braun Aktiengesellschaft, Frankfurt am Main, Germany
Filed Nov. 5, 1969, Ser. No. 19,954
Claims priority, application Germany May 9, 1969
Term of patent 14 years
Int. Cl. D4—*15*
U.S. Cl. D4—15

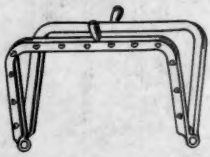
220,240
TOOL FOR UNLOCKING AUTOMOBILE DOORS
George L. Steck, Dayton, Ohio, assignor to Steck Manufacturing Company, Inc., Dayton, Ohio
Filed Feb. 2, 1970, Ser. No. 21,183
Term of patent 14 years
Int. Cl. D8—*02*
U.S. Cl. D8—16

220,241
TOOL FOR UNLOCKING AUTOMOBILE DOORS
George L. Steck, Dayton, Ohio, assignor to Steck Manufacturing Company, Inc., Dayton, Ohio
Filed Feb. 2, 1970, Ser. No. 21,204
Term of patent 14 years
Int. Cl. D8—*02*
U.S. Cl. D8—16



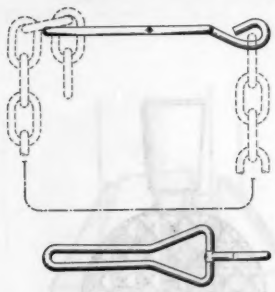
220,242
SPOT-TIE CUTTER OR SIMILAR ARTICLE
Lewis P. David, Norwalk, Calif., assignor to North American Rockwell Corporation
Filed Oct. 20, 1969, Ser. No. 19,619
Term of patent 14 years
Int. Cl. D8—*02*
U.S. Cl. D8—58

220,243
HANDBAG FRAME
Karl H. Nos, 58 Steinheimer Str., 6453 Seligenstadt, Hesse, Germany
Filed Sept. 2, 1969, Ser. No. 18,931
Claims priority, application Germany Mar. 5, 1969
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—125

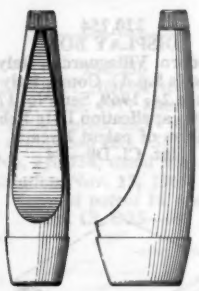


220,244
ELECTRIC DOOR BUTTON FIXTURE
Edward J. Kunkel, Richmond, Calif., assignor to International Corporate Services, Richmond, Calif.
Filed Nov. 13, 1969, Ser. No. 20,075
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—179

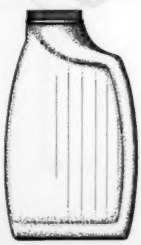
220,245
LATCH
Clarence B. Jefferies, 5134 Darnell, Houston, Tex. 77035
Filed Nov. 12, 1969, Ser. No. 20,042
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—261



220,246
COMBINED BOTTLE AND MEASURING CUP
Joseph G. Pacelli, Stamford, Conn., and Jerome Gould, Los Angeles, Calif.; said Pacelli assignor to Clairol Incorporated, New York, N.N.Y.
Filed Oct. 2, 1969, Ser. No. 19,389
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—10

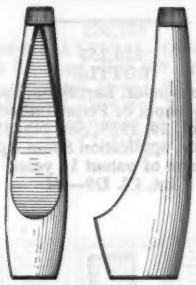


220,247
COMBINED BOTTLE AND CAP THEREFOR
Vittorio Ghisolfi, Tortona, Italy, assignor to Colgate-Palmolive Company, New York, N.Y.
Filed Jan. 7, 1970, Ser. No. 20,794
Claims priority, application Italy July 10, 1969
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—63

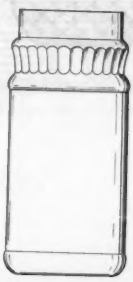


220,248
COMBINED BOTTLE AND CAP THEREFOR
Martin L. Blumenthal, Chatham Township, N.J., assignor to Youth Care, Incorporated
Filed Apr. 7, 1970, Ser. No. 22,298
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—63

220,249
BOTTLE
Jerome Gould, Los Angeles, Calif., assignor to Clairol Incorporated, New York, N.Y.
Filed Oct. 2, 1969, Ser. No. 19,383
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—63

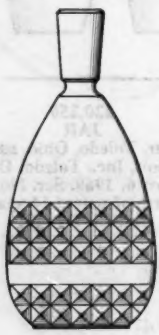


220,250
JAR
James E. Plummer, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Nov. 6, 1969, Ser. No. 19,973
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—92



220,251
COMBINED BOTTLE AND CLOSURE CAP THEREFOR
Myles Basil Hailes, Walton-on-Thames, England, assignor to Lever Brothers Company, New York, N.Y.
Filed Feb. 17, 1970, Ser. No. 21,476
Claims priority, application Great Britain Aug. 22, 1969
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—117

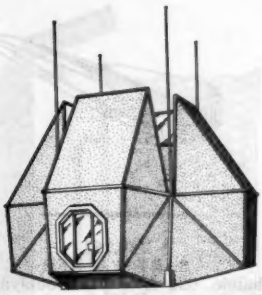
220,252
BOTTLE
Alberto Heusch Fernandez, Barcelona, Spain, assignor to Industria Espanola de Perlas Imitacion, S.A.
Filed Sept. 26, 1969, Ser. No. 19,302
Claims priority, application Spain Apr. 2, 1969
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—135



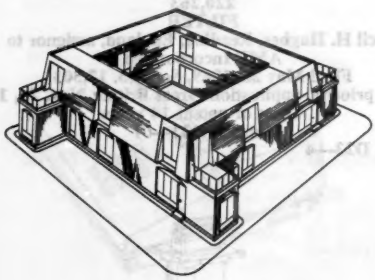
220,253
BOTTLE
Alberto Heusch Fernandez, Barcelona, Spain, assignor to Industria Espanola de Perlas Imitacion, S.A.
Filed Sept. 26, 1969, Ser. No. 19,318
Claims priority, application Spain Apr. 2, 1969
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—135

220,254
DISPLAY BOX
Vincenzo Pomodoro, Villaguardia, Italy, assignor to Neotis S.p.A., Como, Italy
Filed June 24, 1969, Ser. No. 17,848
Claims priority, application Italy Feb. 10, 1969
Term of patent 7 years
Int. Cl. D9—*04*
U.S. Cl. D9—184

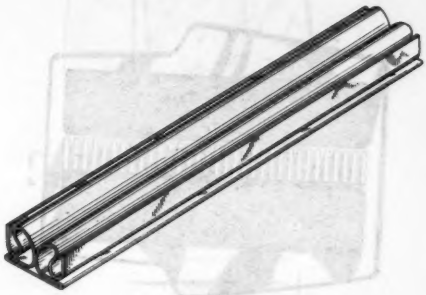
220,255
BUILDING
David B. Runnells, 6017 Windsor Drive, Shawnee Mission, Kans. 66205
Filed Nov. 20, 1969, Ser. No. 20,205
Term of patent 14 years
Int. Cl. D25—*04*
U.S. Cl. D13—1



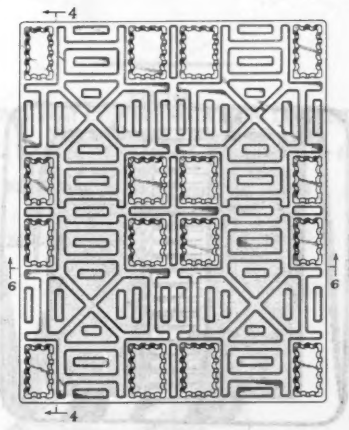
220,256
MULTIPLE UNIT HOUSING STRUCTURE
Louis J. Jenn, 4917 Laurel Circle, Indianapolis, Ind. 46226
Original design application July 15, 1968, Ser. No. 12,739, now Patent No. 216,954, dated Mar. 24, 1970. Divided and this application Nov. 13, 1969, Ser. No. 20,056
Term of patent 14 years
Int. Cl. D25—*04*
U.S. Cl. D13—1



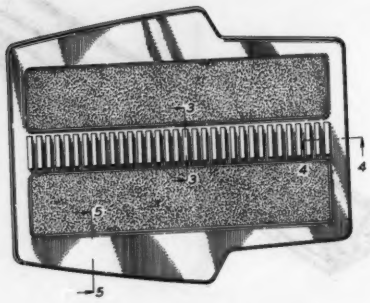
220,257
PARTITION SPACER
Jerome Philip Schooler, Roslyn Heights, N.Y. (10 Setmour Place, London W.1, England)
Filed Nov. 14, 1969, Ser. No. 20,090
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—6



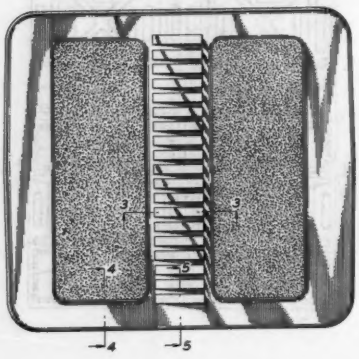
220,258
MOLDED FIBER MATERIAL-HANDLING PALLET
Watson S. Eastman, 4303 SW. Hillside Drive, Portland, Oreg. 97221
Filed July 8, 1969, Ser. No. 18,109
Term of patent 14 years
Int. Cl. D12—*99*
U.S. Cl. D14—3



220,259
AUTOMOBILE FRONT FLOOR MAT AND THE LIKE
William C. Gerber, Wooster, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Nov. 17, 1969, Ser. No. 20,117
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D14—5

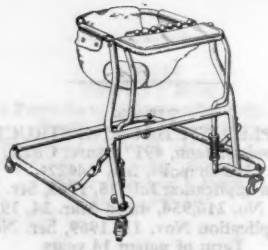


220,260
AUTOMOBILE REAR FLOOR MAT AND THE LIKE
William C. Gerber, Wooster, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Nov. 17, 1969, Ser. No. 20,119
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D14—5

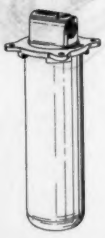


220,261
AUTOMOBILE DOOR GUARD
Erick H. Bjorum, 640 Island View Drive, Seal Beach, Calif. 90740; John G. Gibson, 18 985 Santa Nadrina Circle, Fountain Valley, Calif. 92708; and Morgan C. Lindberg, 12840 Riverside Drive, North Hollywood, Calif. 91607
Filed Nov. 5, 1969, Ser. No. 19,960
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D14—6

220,262
BABY WALKER
Louis E. Shamie, 630 Ave. V., Brooklyn, N.Y. 11223
Filed Dec. 4, 1969, Ser. No. 20,362
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D15—1

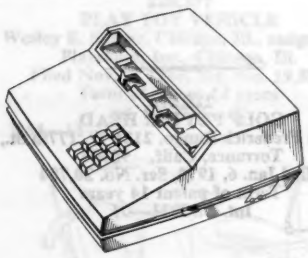


220,263
FILTER
Cecil H. Hughes, Reading, England, assignor to AMF Incorporated
Filed May 23, 1969, Ser. No. 17,303
Claims priority, application Great Britain Nov. 26, 1968
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—4

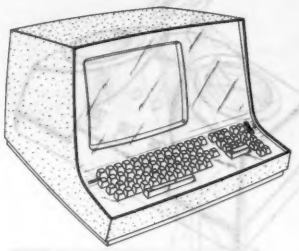


220,264
COMBINED FIREPLACE GRATE AND GRILL
Mark M. Stone, Highland Park, Ill., assignor to Metalex Corporation, Libertyville, Ill.
Application Mar. 13, 1967, Ser. No. 7,138, which is a continuation-in-part of design application Ser. No. 3,423, Aug. 11, 1966. Divided and this application June 19, 1968, Ser. No. 15,403
Term of patent 14 years
Int. Cl. D23—*03*; D7—*04*
U.S. Cl. D23—98

220,265
DATA TRANSMISSION TERMINAL
Clifford I. Dawson, San Jose, Harry W. Johnson, Los Gatos, and Dallas G. Molerin, San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Nov. 19, 1969, Ser. No. 20,317
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5

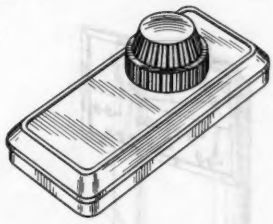


220,266
COMPUTER TERMINAL
John P. Ray and Austin O. Roche, San Antonio, Tex., and John R. Frassanito, Jamaica, N.Y., assignors to Computer Terminal Corporation, San Antonio, Tex.
Filed Dec. 17, 1969, Ser. No. 20,547
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5

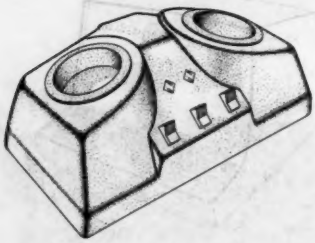


220,267
MINIATURIZED RADIOISOTOPE GENERATOR
Wayne J. Gemmill, Warwick, N.Y., assignor to Union Carbide Corporation, New York, N.Y.
Filed Sept. 6, 1968, Ser. No. 13,429
Term of patent 14 years
Int. Cl. D13—*99*
U.S. Cl. D26—6

220,268
HOUSING FOR COMMUNICATION LISTENING STATION OR THE LIKE
Donald L. Kliewer, Minneapolis, Minn., assignor to The Telex Corporation, Tulsa, Okla.
Filed Aug. 29, 1969, Ser. No. 18,914
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13



220,269
TELEPHONE COUPLER
Karel Jacobs, Huntington Beach, Agazio S. Gugliotta, Hacienda Heights, and Kennon S. Haley, Costa Mesa, Calif., assignors to Vanguard Data Systems, Inc.
Filed Dec. 4, 1969, Ser. No. 20,364
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14

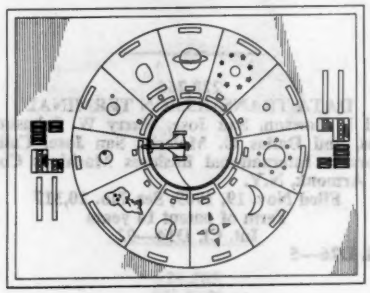


220,270
EAR TAG FOR ANIMALS
Donald David Fearing, 924 Arbor, Mahtomedi, Minn. 55115
Filed Nov. 10, 1969, Ser. No. 20,002
Term of patent 14 years
Int. Cl. D30—*99*
U.S. Cl. D30—43

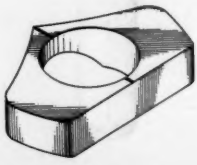
220,271
TIE RACK
Russell W. Miles, Janesville, Iowa 50647
Filed Aug. 11, 1969, Ser. No. 18,641
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D33—8

220,272
RING TOSS TOY
Lee Triplett, Salt Lake City, Utah, assignor to Expando Products Company, Magna, Utah
Continuation of design application Ser. No. 12,916, July 26, 1968. This application Dec. 22, 1969, Ser. No. 20,608
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5

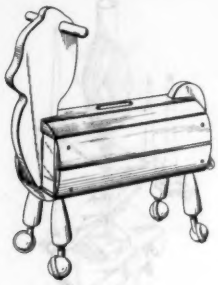
220,273
GAME BOARD
Ralph De Jesus, Imperial Beach, Calif. (P.O. Box 308, New York, N.Y. 10029)
Filed Dec. 15, 1969, Ser. No. 20,517
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5



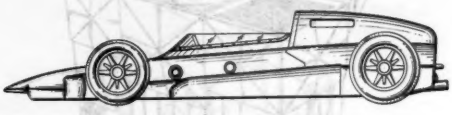
220,274
GOLF PUTTER HEAD
Joseph Frederick Rango, 2126 W. 177th St., Torrance, Calif. 90504
Filed Jan. 6, 1970, Ser. No. 20,784
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5



220,275
HOBBY HORSE
Wesley E. Sharer, Chicago, Ill., assignor to Playskool, Inc., Chicago, Ill.
Filed Nov. 3, 1969, Ser. No. 19,896
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—15



220,276
MODEL RACING CAR
Daniel S. Gurney, Santa Ana, Calif., assignor to All American Racers, Inc., Santa Ana, Calif.
Filed July 16, 1969, Ser. No. 18,224
Claims priority, application Great Britain May 1, 1969
Term of patent 7 years
Int. Cl. D21—*02*
U.S. Cl. D34—15



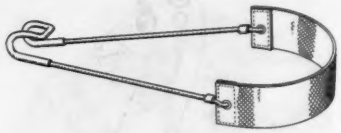
220,277
PLAY TOY VEHICLE
Wesley E. Sharer, Chicago, Ill., assignor to Playskool, Inc., Chicago, Ill.
Filed Nov. 3, 1969, Ser. No. 19,897
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—15

220,278
SCOOTER
Robert J. Licher, 170 N. Adams, and Anthony J. Verbiscar, 491 Crestvale Drive, both of Sierra Madre, Calif. 91024
Filed June 26, 1969, Ser. No. 17,895
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D34—15

220,279
SPINNING TOY OR THE LIKE
Joan L. Oliver, 8 Montego Key, Novato, Calif. 94947
Filed Oct. 15, 1969, Ser. No. 19,573
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—15

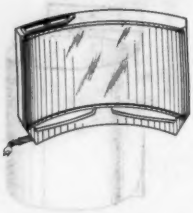
220,280
WALL BRACKET FOR AN ELECTRIC SHAVER CHARGING UNIT
Bruce F. Ray, Danvers, Mass., assignor to The Gillette Company, Boston, Mass.
Filed Dec. 18, 1969, Ser. No. 20,563
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D33—23

220,281
EXERCISING DEVICE
Leo Evan Long, Los Altos, Calif., assignor to Nielsen Engineering & Research, Inc., Mountain View, Calif.
Filed Feb. 26, 1970, Ser. No. 21,640
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5



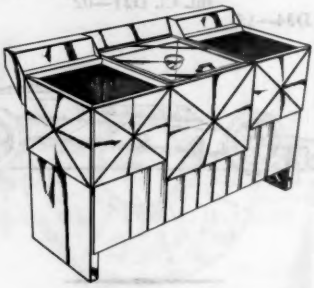
220,282
DINNER PLATE OR THE LIKE
Herbert M. Piker, Wyoming, Ohio, assignor to Sea Fair Corporation, Jacksonville, Fla.
Filed Jan. 7, 1970, Ser. No. 20,793
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D44—15

220,283
LAMP
William F. Suden, 22 Wheland Road, Apt. 11U, Providence, R.I. 02909
Filed Jan. 5, 1970, Ser. No. 20,766
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—20



220,284
COMBINED LAMP AND CANDELABRUM
Paul R. Glasgow, Ohio Soldiers Home, Sandusky, Ohio 44870
Filed Dec. 23, 1969, Ser. No. 20,618
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—20

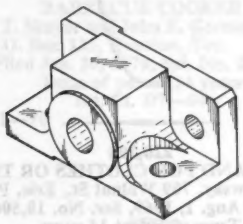
220,285
WASHING MACHINE
Robert C. Cowen, 214 Daniels, Marianna, Fla. 32446
Continuation-in-part of design application Ser. No. 11,416, Apr. 11, 1968. This application June 13, 1969, Ser. No. 17,702
Term of patent 14 years
Int. Cl. D15—*07*
U.S. Cl. D49—1



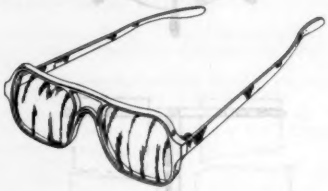
220,286
INCLINOMETER
Mike A. Provi, Rockford, Ill., assignor to Pro Products, Incorporated, Rockford, Ill.
Filed June 25, 1969, Ser. No. 17,864
Term of patent 14 years
Int. Cl. D10—*08*
U.S. Cl. D52—6

220,287
SPOON OR SIMILAR ARTICLE OF FLATWARE
Frank K. Guodace, Meriden, Conn., assignor to International Silver Company, Meriden, Conn.
Filed Feb. 20, 1970, Ser. No. 21,560
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D54—12

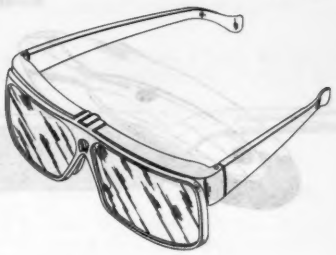
220,288
PILLOW BLOCK
Norman Schweizer, 26—02 S. 7th W., Missoula, Mont. 59801
Filed Dec. 3, 1969, Ser. No. 20,341
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D55—1



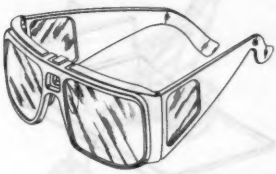
220,289
PAIR OF SPECTACLES
Atherton R. Mitchell, Dillon Beach, Calif., assignor to Renauld International, Ltd., Fitchburg, Mass.
Filed Nov. 19, 1969, Ser. No. 20,175
Term of patent 14 years
Int. Cl. D16—*08*
U.S. Cl. D57—1



220,290
PAIR OF SUNGLASSES
Jack Bloch, Leominster, Mass., assignor to Foster Grant Co., Inc., Leominster, Mass.
Filed Apr. 21, 1970, Ser. No. 22,544
Term of patent 14 years
Int. Cl. D16—*08*
U.S. Cl. D57—1



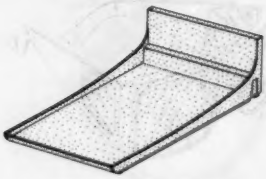
220,291
PAIR OF SUNGLASSES
Jack Bloch, Leominster, Mass., assignor to Foster Grant Co., Inc., Leominster, Mass.
Filed Apr. 21, 1970, Ser. No. 22,545
Term of patent 14 years
Int. Cl. D16—*08*
U.S. Cl. D57—1



220,292
PORTABLE TYPEWRITER
Ettore Sottsass, Jr., 14 Via Manzoni, 20121 Milan, Italy
Filed Nov. 3, 1969, Ser. No. 19,893
Claims priority, application Italy May 3, 1969
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11

220,293
VERTICAL TAKEOFF AIRCRAFT
Joseph Patricny, 87—30 Justice Ave., Elmhurst, N.Y. 11373
Filed Dec. 29, 1969, Ser. No. 20,673
Term of patent 14 years
Int. Cl. D12—*07*
U.S. Cl. D71—1

220,294
DESK TRAY
James E. Joyce, 878 Darien Circle, Rochester, Mich. 48063
Continuation-in-part of design application Ser. No. 15,346, Jan. 14, 1969. This application Nov. 19, 1969, Ser. No. 20,185
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D74—9

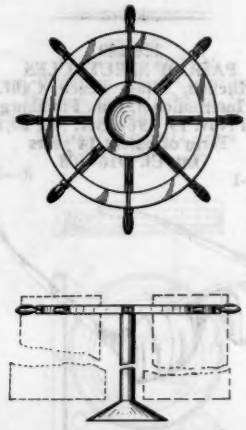


220,295
CASING FOR A MARKER PEN
Robert R. Anderson, Park Forest, Ill., and Moto Shimano, Los Angeles, and Clarence D. Zierhut, Los Angeles County, Calif., assignors to The Gillette Company, Santa Monica, Calif.
Filed Jan. 8, 1970, Ser. No. 20,827
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D74—17

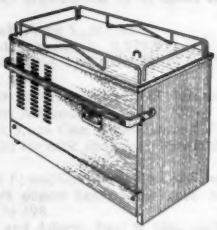
220,296
BALLPOINT PEN
Victor A. Berlin, 67—66 108th St., Forest Hills, N.Y. 11375
Filed Feb. 11, 1970, Ser. No. 21,402
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D74—17

220,297
CRAYON OR THE LIKE
Yehuda Tarmu, 1151 Stearns Drive, Los Angeles, Calif. 90035
Filed Apr. 10, 1970, Ser. No. 22,365
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D74—24

220,298
DISPLAY STAND FOR CLOTHES OR THE LIKE
Michael Naglowsky, 709 Walnut St., Erie, Pa. 16502
Filed Aug. 1, 1969, Ser. No. 18,506
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D80—9

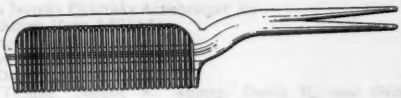


220,299
STOVE
Norman Schott, Burnaby, British Columbia, Canada, assignor to Dickinson's Limited, Burnaby, British Columbia, Canada
Filed Nov. 21, 1969, Ser. No. 20,222
Term of patent 7 years
Int. Cl. D7—*04*
U.S. Cl. D81—10



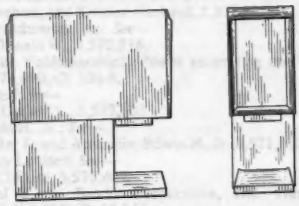
220,300
BARBECUE COOKER
Roger T. Shaper and John E. Germann, both of P.O. Box 125, Houston, Tex. 77001
Filed Jan. 26, 1970, Ser. No. 21,092
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D81—10

220,301
COMB
Gino J. Piermarini, 443 Pleasant St., and Norman C. Burnap, 319 Pierce St., both of Leominster, Mass. 01453
Filed Oct. 9, 1969, Ser. No. 19,481
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—8



220,302
BICYCLE
Glen R. Shaw, P.O. Box 179, Escalante, Utah 84726
Filed Mar. 10, 1970, Ser. No. 21,836
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D90—8

220,303
FROZEN CARBONATED BEVERAGE MACHINE
William A. Gran, Independence, Mo., assignor to The Vendo Company, Kansas City, Mo.
Filed Sept. 12, 1969, Ser. No. 19,131
Term of patent 14 years
Int. Cl. D15—*12*
U.S. Cl. D94—3



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 23D DAY OF MARCH, 1971

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Abeel, Peter C., to Boeing Company, The. Access and pressure release door latch mechanism. 3,571,977, Cl. 49-379.

(ACEC): *See—*
Demeur, Jean, 3,571,667.

Ackley, Robert W.; and Jette, Edwin L., Jr., to Crompton & Knowles Corporation. Self-aligning seal tip for splice box. 3,571,851, Cl. 18-6.

Acne Fund, Hassell, Frank S., Jr.: *See—*
Hassell, Frank Sylvester, Jr., 3,571,953.

Acosta, William A. Valve. 3,572,385, Cl. 137-625.47

Acuna, Mario H.: *See—*
United States of America,National Aeronautics and Space Administration, Administrator, 3,571,700.

Adams, Frederick J., to Cam Gears Limited. Resiliently deformable rack bar support for rack and pinion assembly. 3,572,158, Cl. 74-498.

Adams, Frederick J.; and Goldsmith, Ronald S., to Cam Gears Limited. Pin and socket pinion bearing for rack and pinion assembly. 3,572,157, Cl. 74-498.

Adams, Gail A.; and Adams, Paul B. Hair curler protective device. 3,572,350, Cl. 132-39.

Adams, Paul B.: *See—*
Adams, Gail A.; and Adams, Paul B.,3,572,350.

Adlaf, William J., to Esterline Corporation. Apparatus and method for cutting stock material. 3,572,198, Cl. 82-47.

Admiral Corporation: *See—*
Borg, Arthur N., 3,571,724.

Aerojet-General Corporation: *See—*
Johnson, Richard B., 3,572,251.

Aerospace Systems Company: *See—*
Kriesel, Marshall S.; and Akerman, John D., 3,572,250.

Ainsworth, Glenn C. Vacuum shaver. 3,571,926, Cl. 30-41.5

Air Preheater Company, Inc, The: *See—*
Stockman, Richard F., 3,572,265.

Akerman, John D.: *See—*
Kriesel, Marshall S.; and Akerman, John D.,3,572,250.

Akima, Akira; Yoshida, Kazuyoshi; and Oguma, Tomio, to Honda Giken Kogyo Kabushiki Kaisha. Automatic transmission apparatus. 3,572,179, Cl. 74-869.

Akins, Vaughn E.; Harris, John P.; and Kost, Frederick H., to International Business Machines Corporation. Numerical servo displacement control system. 3,571,685, Cl. 318-603.

Aktiebolaget Bofors: *See—*
Ohlsson, Axel Erik Ludvig; and Skagerlund, Lars-Erik, 3,571,602.

Aktiebolaget Svenska Flaktfabriken: *See—*
Wilhelmsson, Gunnar, 3,572,011.

Aktiengesellschaft Brown, Boveri & Cie: *See—*
Faust, Werner, 3,571,675.
Wallstein, Dieter, 3,571,622.

Albright, William D.: *See—*
Bennon, Saul; and Albright, William D.,3,571,772.

Alcan Aluminumwerke GmbH: *See—*
Schmid, Kurt, 3,571,976.

Alderfer, Sterling W., to Teledyne, Inc., mesne. Industrial rolls. 3,571,878, Cl. 29-132.

Aldridge, Edwin S.: *See—*
Aldridge, Hal F.; Aldridge, Hal L.; and Aldridge, Edwin S.,3,572,209.

Aldridge, Hal F.; Aldridge, Hal L.; and Aldridge, Edwin S. Radial engine. 3,572,209, Cl. 91-188.

Aldridge, Hal L.: *See—*
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Vogelman, Joseph H.; Coe, Robert S.; Hoyt, Kenneth B.; and Feinerman, Bernard, to Chromalloy American Corporation. Physiological signal monitoring system. 3,572,316, Cl. 128-2.05
Von Arx, Paul, to Von Arz AG. Descaling device. 3,571,874, Cl. 29-81.
Von Arz AG: *See—*
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Voncken, Gerard L., to Stamicarbon N. V. Installation for treating liquids. 3,572,415, Cl. 159-6.
Von Ruti, Jurge Leo, to Vibro-Meter AG. Electric amplifier. 3,571,741, Cl. 330-5.
Voss, Joseph A.; and Johnson, Carl W., said Johnson assor. to said Voss. Reinforced hygienic medium applicator tubes. 3,572,339, Cl. 128-260.
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Wade, Gerald James, to Hoffmann-La Roche Inc. Respiratory distress monitor. 3,572,317, Cl. 128-2.05
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Walker, Richard K. Teaching device. 3,571,950, Cl. 35-31.
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Wallace, Robert E.,: *See—*
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Walter, John L.; and Pertwee, Kenneth S. G., to General Electric Company. Stranded tungsten wire incandescent lamp filament. 3,572,399, Cl. 140-71.5
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Walthier, Thomas N.; Rosfelder, Andre Marcel; and Schatz, Clifford E., to Bear Creek Mining Company. Free fall bottom sampler. 3,572,129, Cl. 73-425.2
Warshall, Theodore. Protective RF attenuator plug for wire-bridge detonators. 3,572,247, Cl. 102-28.
Washizuka, Isamu; Hanahara, Hitoshi; and Teramura, Satoshi, to Sharp Kabushiki Kaisha. Decimal point processing apparatus. 3,571,808, Cl. 340-172.5
Watanabe Instruments Corporation: *See—*
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Waterman, John E., to Entwistle Company, The. Imprinting device. 3,572,241, Cl. 101-269.
Watson, Robert Douglas, to Atomic Energy of Canada Limited. Method of cladding a metal surface. 3,571,907, Cl. 29-474.3
Watt, John A., to Kelsey-Hayes Company. Flux reversing sensor. 3,571,640, Cl. 310-168.
Weaver, Alexander Earl. Back scrubber. 3,571,837, Cl. 15-231.
Webb, George T., to International Business Machines Corporation. Self-clocked binary data detection system with noise rejection. 3,571,730, Cl. 328-117.
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Weinreich, Wolfgang: *See—*
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West, Lynn P., to International Business Machines Corporation. Demodulator for pulse width modulated signals. 3,571,736, Cl. 329-104.

Westcott, Carl H., to Atomic Energy of Canada Limited. Method and apparatus for interleaved charged particle acceleration. 3,571,642, Cl. 313-63.

Western Electric Company, Incorporated: *See—*
Beroset, John Edward; and Fuchs, Francis Joseph, Jr., 3,572,035.
Casner, Bernard G.; Goulstone, Ray T.; and Hance, Peter R., 3,572,400.
Fagerstrom, Joseph W.; and Kent, William C., 3,571,889.
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Westin, Sven Birger. Confectionery article mould. 3,572,256, Cl. 107-8.

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Westinghouse Electric Corporation: *See—*
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Whirlpool Corporation: *See—*
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Garfield, Richard L.; and Stacik, Harold S., 3,571,941.

White, Albert H., to Evans, Chandler, Inc. Main fuel metering valve. 3,572,365, Cl. 137-117.

White, Douglas F.; Scadron, Marvin D.; and Faul, Joseph C., to American Standard Inc. Altitude measuring device. 3,572,126, Cl. 73-384.

White, Matthew B.: *See—*
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Whitehouse, David John; Barr, John Denzil; Reason, Richard Edmund; Reeve, Thomas Charles; Spragg, Robert Claude; Starr, Arthur Tisso; and Stillwell, Peter Frederic Thomas Cryer, to Rank Organisation Limited, The. Assessing of surface profiles. 3,571,579, Cl. 235-151.3

Widlar, Robert J. . 3,571,630, Cl. 250-199.

Wieczorek, Alfred B., to General American Transporation Corporation. Ultrasonic non-destructive testing apparatus and method. 3,572,099, Cl. 73-67.7

Wieland, Walter, to Langen & Co. Hydro-pneumatic pressure reservoir. 3,572,389, Cl. 138-30.

Wienand, Michael: *See—*
Becker, Josef; and Wienand, Michael,3,571,559.

Wiggins, Richard F., to Gyromat Corporation, The. Control valves for supplying paint in paint spray installations. 3,572,366, Cl. 137-240.

Wilbur, Donald A., to General Electric Company. Log periodic electron discharge device. 3,571,651, Cl. 315-3.5

Wilhelmsson, Gunnar, to Aktiebolaget Svenska Flaktfabriken. Filtering apparatus for gaseous media. 3,572,011, Cl. 55-290.

Wilkerson, James E., to Tyler Pipe Industries, Inc. Pipe joint make-or-break tool. 3,571,896, Cl. 29-237.

Wilkes, Donald F., to United States of America, Atomic Energy Commission. Roller-band devices. 3,572,141, Cl. 74-89.22

Wille, Herbert S.: *See—*
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William, Thomas Blair: *See—*
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Williams, Buddy Arnold. Brick laying device. 3,571,931, Cl. 33-86.

Williams, Don S.: *See—*
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Williams, Winston F., to Collins Radio Company. Relative position lockout for step-positioned shaft pair. 3,572,135, Cl. 74-10.54

Wilson, Henry Allen. Toy hat. 3,571,811, Cl. 2-195.

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Wires, Harold O.: *See—*
Preble, Duane M.; and Wires, Harold O.,3,571,682.

Wise, Layton A., to Mine Safety Appliances Company. Combination valve and speaking diaphragm unit. 3,572,332, Cl. 128-142.4

Wise, William L., to Tydeman Machine Works, Inc. Circuit for supplying controlled DC loads from polyphase AC sources. 3,571,689, Cl. 321-5.

Wismer, Marco, to PPG Industries, Inc. Method for casting metals in foamed inorganic refractory molds. 3,572,417, Cl. 164-43.

Wolfe, Howard F., to United States of America, Air Force. Wide band siren sytem. 3,572,285, Cl. 116-147.

Wollesen, Donald L., to Arc Incorporated. Internal combustion engine speed limiting apparatus. 3,572,302, Cl.

Woltjen, Duane W., to UMC Industries, Inc. Indexing drive. 3,572,173, Cl. 74-815.

Wood, Charles D., to Southwest Research Institute. Apparatus for breaking a layer of ice on a body of water by repetitive combustive explosions. 3,572,273, Cl. 114-40.

Wood, Lockett E.: *See—*
Braun, Edwin J.; Student, Stanley G., Jr.; Wood, Lockett E.; Thompson, Moody C., Jr.; and Grant, William B.,3,571,597.

Woodham, Edward; and Scoffin, Edward Charles Richard, to Mason, E. N., & Sons Limited. Copying machine and feed apparatus therefor. 3,572,203, Cl. 83-155.

Woodward, Gary F., to Ford Motor Company. Vacuum motor adapted for use in a vehicle speed control mechanism. 3,572,214, Cl. 91-457.

Worcester, Joseph A., to General Electric Company. Squelch circuit. 3,571,718, Cl. 325-478.

Wright, Robert H.; Kellogg, Francis E.; Burton, Donald J.; and Daykin, Philip N., to United States of America, Army. Method apparatus for measuring the insect repellent properties of chemical vapors. 3,572,131, Cl. 73-432.

Wustner, Friedrich, to Siemens Aktiengesellschaft. Plasma welding torch. 3,571,556, Cl. 219-121.

Xerox Corporation: *See—*
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Yaezima, Koro: *See—*
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Yerman, Alexander J., to General Electric Company. Integral semiconductor strain gage transducers with frequency output. 3,572,109, Cl. 73-141.

Yokoyama, Kenjiro: *See—*
Iwata, Koji; and Yokoyama, Kenjiro,3,571,691.

Yoshida, Kazuyoshi: *See—*
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Yoshida, Okio: *See—*
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Yoshida, Susumu; Ohgoshi, Akio; and Miyaoka, Senri, to Sony Corporation. Plural beam electron gun for a color picture tube with different-sized control grid apertures. 3,571,643, Cl. 313-70.

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Youngblood, David Hull: *See—*
Browning, James E.; and Youngblood, David Hull,3,571,974.

Yu, Albert Y.C.; and Snow, Edward H., to Fairchild Camera and Instrument Corporation. Fast switching PNP transistor. 3,571,674, Cl. 317-235.

Yuan, Frank L., to Becton, Dickinson and Company. Disposable electrode with a metallurgically- bonded, silver-silver chloride sensing element. 3,572,323, Cl. 128-2.06

Yui, Saburo: *See—*
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Zachary, James D. Low frequency wide band FM demodulators. 3,571,713, Cl. 325-349.

Zellmann, Rudi: *See—*
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Zemek, Albert W. Belted axial lead electronic component splicing clip. 3,571,862, Cl. 24-36.

Zerkle, Ronald D., 50% to Jefferies, Neal P. Cooling system for cutting tool and the like. 3,571,877, Cl. 29-106.

Zernow, Louis, to United States of America, Air Force. Pulsed hot wire system. 3,572,092, Cl. 73-15.

Zieske, Harrison A.: *See—*
Bloomfield, Daniel K.; and Zieske, Harrison A.,3,572,321.

Zimmer, Peter: *See—*
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Zimmerman, Franklin E.: *See—*
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LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 23RD DAY OF MARCH, 1971

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Barry, Donald W.: *See*—
Broussard, Douglas E., Kinzbach, Kershner, and Barry.
Re. 27,088.

Binder, Alan M. Fuel induction device. Re. 27,087, 3-23-71, Cl. 261—36.

Bountiful, Udy Lex L.: *See*—
Clay, Robert B., and Bountiful. Re. 27,095.

Broussard, Douglas E., R. B. Kinzbach, S. G. Kershner, and D. W. Barry, to Shell Oil Co. Pipe-laying barge with adjustable pipe discharge ramp. Re 27,088, 3-23-71, Cl. 61—72.3.

Bunker Ramo Corp., The: *See*—
Sear, Brian E., Williams, and Stephens. Re. 27,089.

Cavitt, Stanley B., and G. P. Speranza, to Jefferson Chemical Co., Inc. Method for the preparation of 2-amino-1-alkanols. Re. 27,098, 3-23-71, Cl. 260—584.

Clay, Robert B., and U. L. L. Bountiful, to Intermountain Research and Engineering Co., Inc. Ammonium nitrate slurry blasting composition containing sulfur-sodium nitrate sensitizer. Re. 27,095, 3-23-71, Cl. 149—41.

Du Pont de Nemours, E. I., and Company: *See*—
Slocum, Donald H. Re. 27,093.

Fastener Corporation: *See*—
Novak, Edward J. Re. 27,097.

General Electric Co.: *See*—
Morgan, Raymond E. Re. 27,091.

Intermountain Research and Engineering Co. Inc.: *See*—
Clay, Robert B., and Bountiful. Re. 27,095.

Jefferson Chemical Co., Inc.: *See*—
Cavitt, Stanley B., and Speranza. Re. 27,098.

Kershner, Stuart G.: *See*—
Broussard, Douglas E., Kinzbach, Kershner, and Barry.
Re. 27,088.

Kinzbach, Robert B.: *See*—
Broussard, Douglas E., Kinzbach, Kershner, and Barry.
Re. 27,088.

Morgan, Agnes: *See*—
Morgan Raymond E. Re. 27,091.

Morgan, Raymond E., deceased, by Agnes Morgan, administrator, to General Electric Co. Time ratio control and inverter power circuits. Re. 27,091, 3-23-71, Cl. 321—43.

Novak, Edward J., to Fastener Corporation. Fluid motor having a supply-and-exhaust valve carried by the piston. Re. 27,097, 3-23-71. Cl. 91—28.

Procter & Gamble Co., The: *See*—
Walker, Arthur P. Re. 27,096.

Raytheon Company: *See*—
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Rosaen, Borje O.: *See*—
Rosaen, Nils O., B. O., and O. E. Re. 27,094.

Rosaen, Nils O., B. O. Rosaen, and O. E. Rosaen, to Universal Filters, Inc. Method of manufacturing pleated filters. Re. 27,094, 3-23-71, Cl. 29—445.

Rosaen, Oscar E.: *See*—
Rosaen, Nils O., B. O., and O. E. Re. 27,094.

Rutter, Henry A. Individual dry dock for boats. Re. 27,090, 3-23-71, Cl. 61—65.

Sear, Brian E., R. C. Williams, and R. A. Stephens, to The Bunker Ramo Corp. Planar coaxial circuitry. Re. 27,089, 3-23-71, Cl. 317—10.

Shell Oil Co.: *See*—
Broussard, Douglas E, Kinzbach, Kershner, and Barry.
Re. 27,088.

Shrader, William W.: *See*—
Stifter, Francis J., and Shrader. Re. 27,092.

Slocum, Donald H., to E. I. du Pont de Nemours and Company. Thick cured polymethyl methacrylate article and process for its preparation. Re. 27,093, 3-23-71, Cl. 260—41.

Speranza, George P.: *See*—
Cavitt, Stanley B., and Speranza. Re. 27,098.

Stephens, Raymond A.: *See*—
Sear, Brian E., Williams, and Stephens. Re. 27,089.

Stifter, Francis J., and W. W. Shrader, to Raytheon Company. Moving target indication system using a staggered repetition rate. Re. 27,092, 3-23-71. Cl. 343—7.7.

Universal Filters, Inc.: *See*—
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Walker, Arthur P., to The Procter & Gamble Co. Detergent composition. Re. 27,096, 3-23-71, Cl. 252—152.

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All American Racers, Inc.: *See*—
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Anderson, Robert R., M. Shimano, and C. D. Zierhut, to The Gillette Co. Casing for a marker pen. 220,295, 3-23-71, Cl. D74—17.

Berlin, Victor A. Ball point pen. 220,296, 3-23-71, Cl. D74—17.

Bjorum, Erick H., J. G. Gibson, and M. C. Lindberg. Automobile door guard. 220,261, 3-23-71, Cl. D14—6.

Bloch, Jack, to Foster Grant Co., Inc. Pair of sunglasses. 220,290, 3-23-71, Cl. D57—1.

Bloch, Jack, to Foster Grant Co., Inc. Pair of sunglasses. 220,291, 3-23-71, Cl. D57—1.

Blumenthal, Martin L., to Youth Care, Incorporated. Combined bottle and cap therefor. 220,248, 3-23-71, Cl. D9—63.

Braun Aktiengesellschaft: *See*—
Rams, Dieter and Greubel. 220,239.

Burnap, Norman C.: *See*—
Piermarini, Gino J., and Burnap. 220,301.

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Pacelli, Joseph G. 220,246.

Colgate-Palmolive Company: *See*—
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Cowen, Robert C. Washing machine. 220,285, 3-23-71, Cl. D49—1.

David, Lewis P., to North American Rockwell Corporation. Spot-tie cutter or similar article. 220,242, 3-23-71, Cl. D8—58.

Dawson, Clifford I., H. W. Johnson, and D. G. Molerin, to International Business Machines Corp. Data Transmission terminal. 220,265, 3-23-71, Cl. D26—5.

De Jesus, Ralph. Game board. 220,273, 3-23-71, Cl. D34—5.

Dickinson's Limited: *See*—
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Eastman, Watson S. Molded fiber material-handling pallet. 220,258, 3-23-71, Cl. D14—3.

Expando Products Co.: *See*—
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Fearing, Donald D. Ear tag for animals. 220,270, 3-23-71, Cl. D30—43.

Fernandez, Alberto H., to Industria Espanola de Perlas Imitacion. Bottle. 220,252, 3-23-71, Cl. D9—135.

Fernandez, Alberto H., to Industria Espanola de Perlas Imitacion. Bottle. 220,253, 3-23-71, Cl. D9—135.

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Bloch, Jack. 220,291.

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Gemmill, Wayne J., to Union Carbide Corp. Miniaturized radioisotope generator. 220,267, 3-23-71, Cl. D26—6.

Gerber, William C., to Rubbermaid Inc. Automobile front floor mat and the like. 220,259, 3-23-71, Cl. D14—5.

Gerber, William C., to Rubbermaid Inc. Automobile rear floor mat and the like. 220,260, 3-23-71, Cl. D14—5.

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Guodace, Frank K., to International Silver Co. Spoon or similar article of flatware. 220,287, 3-23-71, Cl. D54—12.

Gurney, Daniel S., to All American Racers, Inc. Model racing car. 220,276, 3-23-71, Cl. D34—15.

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Fernandez, Alberto H. 220,253.

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International Corporate Services: *See*—
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Jefferies, Clarence B. Latch. 220,245, 3–23–71, Cl. D8—261.
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Joyce, James E. Desk tray. 220,294, 3–23–71, Cl. D74—9.
Kliewer, Donald L., to The Telex Corp. Housing for communication listening station or the like. 220,268, 3–23–71, Cl. D26—13.
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Lever Brothers Co.: *See*—
Hailes, Myles B. 220,251.
Licher, Robert J., and A. J. Verbiscar. Scooter. 220,278, 3–23–71, Cl. D34—15.
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Miles, Russell W. Tie rack. 220,271, 3–23–71, Cl. D33—8.
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Pacelli, Joseph G., and J. Gould; said Pacelli assignor to Clairol Incorporated. Combined bottle and measuring cup. 220,246, 3–23–71, Cl. D9—10.
Patricny, Joseph. Vertical take-off aircraft. 220,293, 3–23–71, Cl. D71—1.
Piermarini, Gino J., and N. C. Burnap. Comb. 220,301, 3–23–71, Cl. D86—8.
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Sharer, Wesley E. 220,277.
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Maurice H. Stans, *Secretary*

PATENT OFFICE
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